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# COMMON DISEASES

THEIR CAUSES AND TREATMENT

Common Diseases and their causes

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**COMMON DISEASES**  
**THEIR CAUSES AND TREATMENT**

*First Indian Edition*

**Previous Volume**

# **Your Guide to Health in the Tropics**

*By*

Lieut.-Col. M. S. IRANI, F.R.C.S.(Ed.), I.M.S.(Rtd.)

*With 43 Illustrations*

This is a complete and up-to-date medical adviser for the whole family, young and old. In clear, non-technical language, the author gives a reliable and helpful answer to practically every problem of health, hygiene, or sickness that arises in everyday life.

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COMMON DISEASES  
THEIR CAUSES AND TREATMENT

By

Lieut.-Col. M. S. IRANI

F.R.C.S. (Ed.), I.M.S. (Rtd.)

With 3 Illustrations

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## P R E F A C E

IN this second number of the series, general medical and surgical diseases are dealt with as well as pregnancy and diseases peculiar to women, rules for the preservation of health, and care of the eyes. There is a good deal of unnecessary suffering on account of want of elementary knowledge of medical and sanitary matters in this country, and so far very little has been done by the State to dispel this ignorance. In western countries, especially in America, such knowledge is constantly being spread through the press, platform and wireless so that the knowledge of the public is quite up-to-date in matters affecting their health. This publication is an attempt in a small way to enlighten the lay public about the scientific methods of prevention and treatment of diseases.

Medical science has made very rapid progress within the last fifty years as a result of intensive research, and the old ideas about diseases, old methods of treatment and old drugs are rapidly becoming obsolete. More potent drugs and more efficient methods of treatment are being introduced for the alleviation of human suffering and many hitherto fatal and incurable diseases have been robbed of their terror; tuberculosis which takes such a heavy toll of life and which required prolonged and expensive treatment to keep it under control can be checked within a matter of weeks provided it is diagnosed early and taken in hand in time; leprosy is no more an incurable disease and with vigorous and sustained efforts it can be eradicated within the next twenty or thirty years. Similarly, cholera, plague, malaria, dysentery, and other epidemic diseases can be abolished if seriously tackled. To make this possible active co-operation and help from the public are necessary, which cannot be obtained unless the public is enlightened.

In this book, as in the previous volume, technical terms have been avoided as much as possible, but where they are used they are immediately explained in the text. It is therefore not necessary to add a glossary. In case the reader wishes to find the meaning of a technical term a reference to the index will show him where the word will be found explained in the text.

M. S. I.

*N. B.*—References to prescriptions given here are to the previous volume, *Health in the Tropics*, where they are fully dealt with as well as the methods of dispensing.

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## CHAPTER I

### OBESITY AND WEIGHT REDUCTION

Obesity or corpulence means an excessive accumulation of fat in the body which takes place on the abdomen, chest, hips, abdominal organs and heart. Normally, a certain amount of fat is stored in different parts of the body, which acts as a cushion to prevent pressure, to protect certain organs, such as kidneys, and to serve as a reserve of fuel for the production of heat and energy when an unusually large demand is made by the body, as during severe muscular exertion, exposure to abnormal cold and during fever when the consumption is great. In the healthy body under normal conditions there is a natural balancing mechanism which adjusts the intake of food and its expenditure in the body; for instance, in cold weather or during excessive muscular exertion the expenditure of fuel is more than usual, the extra demand is met by increased appetite and additional intake of food. As long as this balance between the intake and expenditure is maintained there is neither an accumulation of fat nor an abnormal depletion so that the weight of the body remains more or less constant in grown up persons. But when this balance is disturbed, either by excessive intake, as in habitual overeating, especially when the food is rich in fat and carbohydrates, or when the expenditure in the body is below normal, the excess is stored as fat. In fever and wasting diseases when the intake is necessarily limited and the expenditure high, the reserve is drawn upon, and if the demand continues for long, not only all of it disappears, but the body tissues are also used up as fuel. The same thing happens in case of indiscriminate and unscientific method of fasting indulged in by some women who are anxious to improve their figure by "slimming." Not only lifelong injuries are caused to vital organs, but tuberculosis and other dangerous diseases are likely to find a favourable soil in such emaciated bodies.

The causes which operate towards the production of obesity may be divided into exogenous or extrinsic and endogenous or intrinsic. The intake of more food than what can be used up in the body, or of the wrong kind of food is an important exogenous cause which operates in more than 85% of people who are obese. Care-free persons, who eat and sleep well and who are not fond of outdoor exercise, are inclined to grow fat. Habitual and excessive use of alcohol contributes to a very great extent towards the production of obesity. Being very easily oxidizable, it is readily used up in the body as fuel; it thus spares carbohydrates and fat ordinarily used for the purpose. After forty there is a tendency in majority of people to put on weight, as, after that age the expenditure of fuel gets less while the intake remains the same as before.

In the endogenous variety, which is ordinarily seen in young persons, though not solely confined to them, the expending part of the mechanism in the body is at fault, as a result of which a small part of the intake is used up, while the rest accumulates as fat. The combustion of fat

and carbohydrates in the body is regulated by the internal secretion of certain glands known as endocrine glands; these are, thyroid situated in front of the neck, pituitary situated inside the skull, and gonads or glands of reproduction. Apart from these there are other factors which are concerned with the occurrence of obesity, viz., sex, heredity and race. In the female after menopause there is a tendency to put on fat which is due to diminished activity of the gonadic glands. This tendency runs in certain families and certain races, and depends to a great extent on the food, general habits and mode of living. Inhabitants of cold countries who stay in the tropics for long tend to grow fat, if they continue the same food as they used to take at home.

The effect of obesity on the body differs in different persons and depends to a very great extent on the patient's age, general health, habits and the rate of growth of the fat. A slight degree of obesity, especially in young persons of active habits, produces no ill effects or any inconvenience; even an increase of a stone or so may not produce any unpleasant symptoms; but if the tendency is unchecked the general health may be unfavourably affected. It has been ascertained from health statistics that diabetes, diseases of the heart, blood-vessels, lungs and kidneys attack obese persons with much greater frequency and thereby adversely affect their prospects of longevity. Insurance companies, for the same reason, charge an extra premium to insure such lives.

The first discomfort to be noticed by the person putting on an abnormal amount of fat is difficulty of breathing or panting on slight physical exertion with increasing muscular weakness. The increased weight of the body not only throws additional work on the heart, but the accumulation of fat in the heart muscle impedes its action. Any co-existing disease of the heart, kidneys or any other organ is very adversely affected as a result of defective circulation. Dyspepsia is another early symptom of over-feeding, which is nature's attempt to remedy the trouble by limiting the intake of food, but most of the sufferers, instead of taking this hint from nature, take stimulants to improve the appetite and add further to their trouble. Sooner or later the function of the liver is affected and acidity, heart-burn, palpitation, constipation, gall stones, mental irritability and sleepiness after meals are added to the trouble.

The onset of endogenous or glandular obesity is, as a rule, sudden and its progress rapid; it more often affects children and adolescents than grown up persons. In children the appearance is very characteristic. The growth of the body is impeded and the sex organs are under-developed. If the trouble commences in adult life after the body is fully grown, impotence, sterility and frigidity are likely to result, and in women menstrual disturbances are frequent. In obesity due to thyroid deficiency the skin becomes dry, thick and rough, the nails become thin and brittle, the hair falls, the pulse is slow and the temperature below normal. Mental dullness, inability to concentrate the mind, a feeling of mental and bodily fatigue and hypersensitiveness to heat and cold are also present.

In obesity, as in any other condition, prevention is better than cure. It is a good plan for every person after forty to weigh himself once or twice a month and take the measurement round the abdomen at the level of the navel and check any tendency towards an excessive increase of weight and girth by diminished intake, especially of fat and carbohydrates, and increased expenditure by regular exercise. With a little knowledge and effort, it is not at all difficult to adjust the balance between the two so as to maintain the body weight at more or less a constant level. This is much easier and requires less drastic measures to keep the weight down than to bring it down after it has gone up. It must be remembered that after the body has fully grown the need for the intake is less; but very few people with good appetite have the strength of mind to reduce the intake to the required level.

In this connection a word of warning will not be out of place against the indiscriminate and very harmful practice of weight reducing or "slimming" indulged in by some persons, especially young women, to improve the figure, as, such practice is extremely injurious to health, particularly so, if the weight is brought down too rapidly or too much below the normal level. (See the table of height and weight on page 7). Apart from this, in many prolonged and wasting diseases a slightly over-weight patient has much better prospects of recovery than one whose weight is below the normal level. In case of latent tuberculosis, or if the person is exposed to tubercular infection, as almost all persons are nowadays, the consequences of weight reduction might be disastrous. Old age is no contra-indication to weight reduction, provided the general health is good, all the organs are sound and the dieting and exercise are not overdone. In case of obese children great care is necessary and weight reduction should not be lightly undertaken, but a medical man should be consulted and the treatment carried out directly under his supervision. Neurotic, hysterical and melancholic patients are difficult to treat, as, not only that they do not possess sufficient resolution and are incapable of exercising self-discipline required for the successful treatment, but they are apt to attribute any illness occurring during the course of treatment to what they consider the ill effects of weight reduction.

The treatment of obesity consists in diminished intake and increased expenditure or, in other words, less food and more work. Diet is an important factor, while exercise is an essential adjunct and these two should be so arranged that the expenditure is slightly in excess of the intake. Massage and steam baths may also be employed when convenient, as also cold bath if it could be tolerated without discomfort. Drugs play a very insignificant part in the treatment of obesity of exogenous origin; most, if not all the patent remedies so profusely advertised in papers by quacks, often under fictitious doctors' signatures, are either quite useless, or, more often, very harmful and should be avoided altogether. The cost of these nostrums, as determined on chemical analysis, is found to be quite insignificant, while the price charged for them is most exorbitant. Obesity due to endocrine deficiency is successfully treated by the administration of the gland substance

or the active principle extracted from it, but such treatment should not be undertaken except under medical advice and supervision.

A healthy individual, in order to maintain the body-weight at a constant level, requires what is known as "maintenance diet," viz., the quantity of food sufficient to produce the required amount of heat and energy under different conditions of physical work, climate, etc. The caloric value of such a diet per pound of ideal body-weight is shown below:

At rest	..	..	12 to 14 calories.
Light work	..	..	16 to 18 "
Moderate work	..	..	19 to 20 "
Hard work	..	..	22 to 25 "

From the above table the total calories required for any ideal weight could be easily worked out; for instance, for an individual with an ideal body-weight of 10 stones or 140 lbs. the calories required are:

At rest	..	..	1680 to 1960
Light work	..	..	2240 to 2520
Moderate work	..	..	2660 to 2800
Hard work	..	..	3080 to 3500

The following table gives the caloric value of different items of food from which a dietary could be easily worked out to include the total calories necessary for maintaining the ideal body-weight. The lower of the two figures given above should be taken to start with and its effect on the weight observed. If it goes up or remains steady a few calories should be reduced, or if it goes down too rapidly it should be slowly increased. It should be remembered that the food, whatever its caloric value, should contain, not only all the food factors, viz., protein, fat, carbohydrates, salt, etc., but the necessary vitamins also. (See Vitamins, page 63, Vol. I).

*Table showing the caloric value of some common items of food*

Milk 6 oz.	..	..	120	<i>Vegetables:</i>			
Butter 1/2 oz.	..	..	110	Artichoke 4 oz.	..	..	90
Cream 1 oz.	..	..	110	Asparagus 4 oz.	..	..	30
Ghee 1 oz.	..	..	120	Beetroot 4 oz.	..	..	55
Lard 1 oz.	..	..	260	Cabbage 4 oz.	..	..	16
Olive oil 1 oz.	..	..	260	Cauliflower 4 oz.	..	..	20
Sugar 1 oz.	..	..	120	Cucumber 4 oz.	..	..	15
Bread, white 1 oz.	..	..	75	Lettuce 4 oz.	..	..	12
" wholemeal 1 oz.	..	..	70	Peas, green 4 ozs.	..	..	80
Jam 1 oz.	..	..	100	Potato, boiled 4 oz.	..	..	100
Egg 1	..	..	75	Potato, sweet 4 oz.	..	..	145
Marmalade 1 oz.	..	..	95	Spinach 4 oz.	..	..	32
Porridge, oatmeal 1 oz.	..	..	85	Tomato 4 oz.	..	..	35
Rice, unpolished 1 oz.	..	..	110	Turnip 4 oz.	..	..	45
Cornflour 1 oz.	..	..	105	Olives 4 oz.	..	..	250
Sago 1 oz.	..	..	105	Vegetable marrow 4 oz.	..	..	16
Macaroni 1 oz.	..	..	110	Leek 4 oz.	..	..	30
Arrowroot 1 oz.	..	..	120	Radish 4 oz.	..	..	22
Fish 1 oz. except salmon, sardines and herrings	..	..	30	French beans 4 oz.	..	..	12

Chicken, boiled 1 oz.	..	50	<i>Fruits:</i>		
" roasted ..	..	55	Apple 4 oz.	..	64
Beef, lean boiled 1 oz.	..	42	Apricot 4 oz.	..	45
" roasted ..	..	45	Banana 4 oz.	..	110
Veal, lean 1 oz.	..	40	Cherry 4 oz.	..	70
Mutton, lean boiled 1 oz.	..	40	Fig, fresh 4 oz.	..	50
" roasted ..	..	45	Grapefruit 4 oz.	..	45
Pork, lean 1 oz.	..	50	Grapes 4 oz.	..	300
Bacon 1 oz.	..	170	Gooseberries 4 oz.	..	45
Ham 1 oz.	..	95	Lemon 4 oz.	..	10
Sausages 1 oz. pork	..	140	Melon, musk 4 oz.	..	55
" bologna ..	..	75	Orange 4 oz.	..	55
Soup, chicken, mutton or			Peach 4 oz.	..	45
beef one cupful ..	..	5	Pears 4 oz.	..	50
Soup, vegetable ..	..	30	Papaya 4 oz.	..	30
Cheese 1 oz.	..	100 to 160	Pineapple 4 oz.	..	60
Jellies 1 oz.	..	150	Plum, fresh 4 oz.	..	25
			Raspberries 4 oz.	..	30
			Strawberries 4 oz.	..	30
			Mangoes 4 oz.	..	80

The above figures are approximate, as they are naturally liable to vary within narrow limits for different samples of the same article, but for all practical purposes they can be safely used for working out the total number of calories in the daily diet. From this table it will be easy to work out a dietary with daily variations so as not to be monotonous to suit individual needs. For the convenience of readers a low caloric diet containing about 1200 calories is given below, the caloric value of which could be altered to suit individual requirements by increasing or diminishing the quantity or number of the items.

#### *Early morning:*

One cup of tea with two small teaspoonfuls of sugar and 2 biscuits.

#### *Breakfast:*

One cup of tea.

One egg.

Porridge one oz. with milk 6 oz. and sugar  $\frac{1}{4}$  oz.

Butter  $\frac{1}{4}$  oz.

Bread, wholemeal, two thin slices.

Any one of the following:—One apple, peach or pear, half a banana, half a grapefruit, 1 oz. of grapes, 3 oz. of pineapple or 8 oz. of melon.

#### *Lunch:*

Fish 6 oz. except salmon or sardines; *or*

Lean mutton *or* beef 4 oz.

Potato, boiled 2 oz.

Vegetables 6 oz. *or* salad 6 oz.

Cheese  $\frac{1}{2}$  oz.

Bread, wholemeal, two thin slices.

Biscuits, dry, two.

#### *Dinner:*

Soup, clear 8 oz.

Fish, except salmon and sardines 6 oz. *or*

Chicken 4 oz. *or*

Mutton *or* beef, lean 4 oz. *or*  
Veal, lean 5 oz.  
Potato 4 oz.  
Vegetable 6 oz.  
Sweets 2 oz.

The above diet is given as a rough guide; it may be varied by exchanging the items with others, provided the caloric value of the new items or the whole diet remains the same. For the purpose of reducing the body-weight it is not really necessary to calculate the caloric value of food and regulate one's diet accordingly. A very simple plan is to reduce gradually the total quantity of daily intake without altogether omitting any particular item, but by reducing the quantity of all the items taken, particularly limiting the quantity of fatty and carbohydrate foods. The effect on the body-weight should be noted once a fortnight and the reduction continued until it reaches the normal level or a little below it. Periodic fasting without any method or completely omitting some items, such as fat or carbohydrate, is very harmful. Occasional fasting for 24 or 36 hours may be necessary and is beneficial when the digestion is upset and the stomach requires rest.

Next to diet regulated exercise is necessary in the treatment of obesity, as it not only uses up the accumulation of extra fat in the body, but stimulates the circulation, improves the tone of the muscles and produces a sense of well-being. However, great care and judgment are required to prescribe the proper amount of exercise, especially for a very fatty person who is not only handicapped by the excess of weight, but whose heart is weak and unable to bear any great or sudden strain. For a person under forty-five whose weight is not very much above the normal and whose heart does not show signs of weakness and he does not readily get out of breath, active sport or such games, as tennis, badminton, rackets, swimming, etc., are recommended. The amount of exercise taken should be properly regulated and very gradually increased to the full capacity so that there is no undue fatigue or over-exertion. There are various mechanical devices for exercise, such as dumb-bells, clubs, chest expanders, sculling and cycling machines for indoor use which may be used when available. Many special exercises have been devised for reducing the abdomen and hips, but all these are apt to be monotonous and are given up after a time.

For those whose weight is very much above the normal and whose heart's action is impaired such exercises are harmful. They should take walking exercise, at first at a slow pace and on a measured distance, and very gradually increase the speed and distance so that there is no palpitation or breathlessness which are the signs of heart strain. Whatever diet or exercise is adopted it should be borne in mind that a very gradual reduction of weight is to be aimed at so as to allow the body to adjust itself to the new condition. In no case should the reduction exceed four or five pounds a month.

Massage and electricity are also used, but besides being expensive

they are not very helpful. The former may be tried if after exercise there is a prolonged sense of fatigue or pain in the limbs. Cold baths are sometimes used in the treatment of obesity, but many persons cannot tolerate them and they are not at all suitable for old persons unless they are used to them.

When the obesity is due to glandular or endocrine causes, as in thyroid or pituitrin deficiency, the proper treatment is the administration of the gland substance or its active principle. These are available in tablet form or hypodermic injections. These should be administered only under medical advice and supervision as they are very potent substances.

The following table, showing the average weight of Indian men and women according to height, has been worked out from a large number of weights taken. A deviation of about eight pounds in either direction should not be regarded as abnormal, as the weight varies, not only according to the height, but according to the size of the muscles and the thickness of bones which vary in different persons. The average weight in most of the European countries and America is decidedly higher than in India for the same height. The average weight of a male five feet in height may be taken as 114 lbs. and to calculate roughly the weight for any height four lbs. may be added for every inch above five feet, and for a female from four to eight pounds may be deducted from this. In order to prevent any errors the weight should be taken on reliable scales which should be checked periodically against known weights. The conditions as regards clothes, food, etc., should be identical every time the weight is taken.

<i>Height</i> <i>Ft. in.</i>	<i>Weight</i>	
	<i>Men</i> <i>Lbs.</i>	<i>Women</i> <i>Lbs.</i>
5- 0	114	110
5- 1	118	114
5- 2	123	117
5- 3	127	120
5- 4	131	124
5- 5	135	129
5- 6	139	134
5- 7	144	138
5- 8	150	143
5- 9	154	149
5-10	159	154
5-11	163	158
6- 0	168	162

#### *Average weight of Children*

<i>Age</i>	<i>Weight in pounds</i>		
At birth	..	..	7
1 month	..	..	8

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2 months	..	..	9½
3        „	..	..	11
4        „	..	..	12½
5        „	..	..	14
6        „	..	..	16
7        „	..	..	17
8        „	..	..	18½
12       „	..	..	20

## CHAPTER II

### DISEASES OF METABOLISM

**Diabetes.** The term diabetes is applied to a disease in which the patient suffers from excessive thirst, and frequent micturition, passing large quantities of urine, which may or may not contain sugar; in the former case it is known as diabetes mellitus and in the latter as diabetes insipidus. These two are different diseases and originate from different causes, their common feature being frequent and excessive micturition.

**Diabetes Mellitus.** It is a disease of nutrition in which the normal process of storage and expenditure of sugar in the body is disorganised so that the sugar, instead of being stored in the body and used when required, is excreted in the urine. Normally, all carbohydrate food is converted into glucose in the intestinal canal and after being absorbed it is stored in the liver and muscles until required for use for producing heat and energy. The blood contains .18 per cent of sugar which remains at a constant level, and as it is being used by the tissues it is immediately replaced from the reserve stock. The storage and consumption of sugar in the body is controlled by a substance called *insulin*, which is secreted by the pancreatic gland. It also secretes pancreatic fluid which is conveyed to the intestinal canal through a duct, and which is concerned with the digestion of food. Insulin is not conveyed through any duct but is directly absorbed into the blood from the gland; it is therefore known as the internal secretion of the pancreas. When for some reason this internal secretion is absent and insulin is not available, the glucose that is absorbed into the blood cannot be stored or used by the tissues and it accumulates in the blood, and as soon as its proportion rises above .18 per cent the kidneys begin to excrete it and it appears in the urine. Thus the supply of fuel available for the ordinary requirements of the body is very low and very little is available for an additional demand, as during physical exertion or in cold weather. This lowers the vitality of the body and makes it very susceptible to attacks by pathogenic, i.e., disease producing micro-organisms, and unfit for any sustained physical exertion.

Diabetes is the disease of the rich and is very common in obese and gouty persons who habitually indulge in overeating and alcoholic drinks and who lead a sedentary life. It is very rare among the poor and labouring classes whose diet is simple and who cannot afford the luxury of overeating. It is much more common in adult life though younger persons are not altogether immune. Persons suffering from septic conditions, chronic liver disease and toxic goitre are liable to suffer from it. Sudden emotional disturbance or shock, constant mental overwork and serious injury to the head or the nervous system are some other factors in the production of diabetes. During pregnancy and certain other conditions some sugar temporarily appears in the urine, but this has no special significance.

The onset of the disease is very gradual and it is not noticed by the patient for months and very often its presence is discovered in the course of an examination for some other trouble. The first symptom to be noticed by the patient is frequent micturition which disturbs his sleep and he may have to get up several times during the night to empty the bladder. He has great thirst and has to drink large quantities of water to replace the loss caused by the excessive secretion of urine. Similarly, the appetite increases enormously so as to replace the loss of sugar; but this is not marked in chronic cases in old patients. Muscular weakness and loss of weight soon follow. The skin is dry and itchy and the body temperature is subnormal. The urine has a peculiar fruity odour, especially in advanced cases; its specific gravity rises and depends chiefly on the amount of sugar present in it; it may be as high as 1045, that of the healthy urine being rarely above 1025.

It is easy to detect the presence of sugar in the urine by chemical analysis. For this purpose a spirit lamp, a couple of test tubes about half an inch in diameter, a test tube holder, a glass pipette and a few ounces of Benedict's solution, which can be purchased from a chemist, are required. About half an inch of the test tube is filled with the solution and to it a few drops of the urine are added by means of the pipette. The solution is then boiled over the spirit lamp. If sugar is present the colour of the solution, which is blue, changes to green if the quantity of sugar in the urine is small, or to brown or copper colour if it is large. The altered colour of the solution and the specific gravity of the urine give some rough indication as to the percentage of sugar present, but the exact amount can be ascertained with the same solution.

As a rule the disease is milder in middle aged and old persons, who can tolerate a certain amount of carbohydrates without an increase of sugar in the urine. In such patients with diet and regulated exercise it is possible to control or do away with the presence of sugar and they are able to lead a fairly active and comfortable life. In young persons the onset is more or less sudden and the disease runs a rapid course terminating fatally within a short time. Neuritis, particularly of the lower extremities, is a common complication in chronic cases; it is characterised by constant dull aches or shooting pains.

On account of constant low vitality diabetic patients are very liable to get tuberculosis and septic infections which appear in the form of boils, eczema, carbuncles and gangrene. As a result of incomplete oxidation of glucose in the body certain organic acids accumulate in the blood and produce a condition known as acidosis in which the normal alkaline contents of the blood are reduced. When this happens gradually it can be remedied by suitable treatment; but when it is acute and comes on suddenly it produces serious symptoms, such as nausea, severe pain in the abdomen, vomiting, drowsiness, unconsciousness and coma which may terminate fatally.

The first consideration in the treatment of diabetes is to keep the urine free from sugar as much as possible, which can be done by

carefully regulating the diet so as to provide no more than enough calories to meet all requirements of the body to maintain normal weight and strength. This has become possible since the discovery of insulin by Dr. Banting of Canada in 1922. The administration of this substance hypodermically allows the patient to take the ordinary amount of carbohydrates without any sugar appearing in the urine. In chronic cases in old persons it is better to have as little recourse to it as possible and depend more on the diet and exercise for controlling the sugar in the urine.

The most important point to remember in dieting is not to cut out all carbohydrate food at once or even reduce it quite suddenly, but to diminish it gradually, otherwise very grave symptoms are likely to arise. For the normal functioning of the body carbohydrates are quite necessary and stopping them suddenly, especially in a diabetic patient, in whom the vitality of the body is low, will produce very harmful effects on the body. Another very important thing for the patient to remember, is not to worry at all for his condition, as any kind of mental strain makes the disease worse and hastens the end. He should keep a careful record of his weight, the frequency of micturition, quantity and specific gravity of the urine passed during twenty-four hours and, if possible, the percentage of sugar present. A temporary rise or fall in the quantity, specific gravity and the percentage of sugar are of little importance, as such variations occur during twenty-four hours of the day.

In old and mild cases it is only necessary, without following any particular diet table, to reduce the quantity of carbohydrates taken without omitting them altogether. With a little exercise this will suffice to reduce the amount of sugar passed as also the frequency of micturition. In such cases a small percentage of sugar in the urine should not cause any anxiety, provided the body-weight is maintained. The fasting treatment for removing sugar from the urine may be resorted to in more severe cases, especially in fatty patients, or when for some reason or other insulin cannot be used. A saline purgative is taken the first thing in the morning so as to empty the bowels and relieve the congestion of the liver and nothing is taken for twenty-four or forty-eight hours, except water. Weak tea without sugar or milk may be taken in which a thin slice of lemon is squeezed. After this period sugar completely disappears from the urine, but in some bad cases it may take longer to do so. It is advisable to take rest and avoid physical exertion during fasting, though it has no harmful effects on the body and in obese patients it is distinctly beneficial and they feel brighter after undergoing the treatment. After the disappearance of sugar a certain amount of tolerance for carbohydrate food is established and the patient, by very gradually increasing his diet, is able to retain the urine free from sugar for some time. On the first day of breaking the fast he should take a soft-boiled egg, one thin slice of toasted bread, a cup of vegetable soup, a couple of dry biscuits and tea with very little or no sugar. This should be increased by slow degrees until sufficient quantity is reached to meet the require-

ments of the body. In some few patients in whom the sugar tolerance is very low this treatment is not likely to be of any use; they will require the administration of insulin for controlling the sugar.

Insulin, though it does not cure the disease, allows the patient to take the full diet and maintain his weight and strength and lead an active life for many years. It is very rapid in its action and quickly relieves dangerous complications of the disease, such as acidosis, coma, etc. With a little instruction the patient can administer the drug himself hypodermically (see page 218 of Part I). The original preparation is in a soluble form; it gets absorbed very rapidly and produces its maximum effect within a short time, but the effect soon wears off so that in order to keep the urine free from sugar it is necessary to give an injection just before or soon after each meal. This is very tedious and liable to cause accidents, especially when the patient has to administer it himself. Ordinary insulin is, therefore, used in diabetic emergencies or when immediate effect is desired. Other preparations of insulin, which are less rapidly absorbed and produce more sustained effects, are now used for all ordinary purposes. These are known as protamin insulin or zinc protamin insulin. Only one injection of one of these, preferably the latter, is given just before breakfast. In every case treated with one of these it is very necessary to take sufficient amount of carbohydrate food or glucose, as otherwise serious symptoms due to excessive depletion of sugar in the system are likely to arise. In the first place it is advisable to consult a doctor and commence insulin treatment under his advice and supervision.

Since the discovery of insulin other remedies have become quite obsolete. Opium was at one time used and is still in use among certain class of people in India. It has no beneficial effect on the course of the disease, but is useful in allaying the pain due to diabetic neuritis. Codeine, one of the active principles of opium, was used in the same way with the same result. Another remedy very commonly used in India is the powdered seeds of *Jambul* (*Eugenia Jambolana*). It is not known how they act, but seem to be beneficial in old cases. The dose is 120 to 180 grains twice a day, the powder being swallowed with a little water. Another drug, which was at one time loudly advertised, and which forms the chief ingredient of many quack remedies proclaimed as certain cure for diabetes, is powdered dried leaves of a plant known as *Gymnema sylvestre*, known in the Deccan as *kavli wakandi*. It has absolutely no effect on the disease nor on the excretion of sugar. The belief about its efficacy in diabetes seems to have originated from the fact that the leaves when chewed temporarily paralyse the nerve terminations in the tongue which convey sweet and bitter sensations, so that sugar and bitter substances have no taste for the time being. Since the introduction of fasting treatment by Dr. Allan and the discovery of insulin all other methods of treatment have become obsolete.

It will be seen from the above description that diabetes is a preventable disease and the preventive measures consist in avoiding over-eating, limiting the intake of sugar and other carbohydrates, as also

fat, especially after the age of forty, and taking regular exercise so as to use up excess of glucose that may be accumulating in the body. Food taken in excess of the requirements of the body does not add to its strength, but on the contrary by clogging the system it becomes a potent source of weakness.

**Diabetes Insipidus.** Diabetes insipidus is a chronic disease characterised by the passage of large quantities of dilute urine which is free from any abnormal constituent, and by an excessive thirst. It usually occurs in young grown up persons, less commonly in children, and is more common among males than females. There may be an inherited tendency when several members of the family are affected. It is also met with in persons suffering from an organic disease of the brain or an injury to the head, and in chronic alcoholic subjects. When no cause is traceable the disease is known as primary, but when it is the result of an injury to the brain or some other cause it is known as secondary.

In primary cases the onset, as a rule, is gradual and the patient passes increasing amount of pale watery urine whose specific gravity is low, being below 1006, the total quantity passed during twenty-four hours may exceed forty pints. To replace this loss of water there is an insatiable thirst. There may be no other symptoms for a long time and the disease may disappear spontaneously after months or years. The general health may not be affected at all, but in the long run the signs of depletion of fluid from the system, viz., excessive thirst, dry skin, constipation and abdominal pain, become manifest. Hysterical patients occasionally suffer from an excessive secretion of urine but this is temporary.

The primary disease may last for years and may disappear without any treatment. There is no specific cure for it, but in some cases hypodermic injections of pituitary gland extract is beneficial. It has to be given twice or thrice a day. In secondary cases the original condition requires appropriate treatment.

**Gout.** Gout is a nutritional disease producing acute or chronic inflammation of the smaller joints of hands and feet on account of an excess of uric acid in the blood and a deposit of urates in and around the joints, ears and other parts of the body. It is rare before the age of thirty and in women. Many cases show a hereditary tendency which may be transmitted through females without themselves suffering from it. Like diabetes it is a disease of the rich and is met with in those who habitually indulge in overeating, especially nitrogenous food, and in alcoholic drinks, particularly sweet wines and fermented malt liquors. Chronic lead poisoning is also a predisposing cause and acts by disorganizing nitrogenous metabolism in the body.

An acute attack usually comes on suddenly at night or in the early morning when the patient is comfortably warm in bed. He is awakened from sleep by pain of a burning or crushing character in the ball of the great toe which is aggravated on movement or pressure, but it begins to abate after a time. The skin over the joint becomes shiny red in colour and swollen and there is some fever with headache,

constipation and loss of appetite. The symptoms abate during the day but recur at night and continue for a week or ten days after which the patient is free from discomfort. A second attack may follow after months or years or if the patient is careful about his diet, exercise, etc., he may be free for life. If the disease becomes chronic the symptoms are more or less continuous without any free interval and the small joints of the hands are also involved increasing the patient's discomfort and disability. The swelling of the joints causes great deformity. The deposit of urates may also be found in other parts of the body, particularly in the external ears. The swollen skin over the joints sometimes bursts and discharges white chalky powder or thick creamy fluid containing urates. Sooner or later the general health suffers and the arteries become hard and brittle, the blood pressure rises and apoplexy may result from it. Gouty patients are liable to suffer from diabetes.

A person with a hereditary history of gout, or one who is inclined to put on weight from over-indulgence in food and drinks should adopt preventive measures especially after the age of thirty-five. He should limit the intake of food, avoid sweet wines and malt liquors, keep his bowels free by regular saline purgatives and take regular exercise to keep his weight within normal limits. Drinking plenty of fluids helps the kidneys to remove the accumulation of uric acid from the blood. A large tumblerful of warm water, in which half a teaspoonful of either bicarbonate or citrate of potassium is dissolved, taken half an hour before breakfast and repeated during the day, is very useful in stimulating the secretion of urine. Red meat in the diet is to be avoided or limited; fish, chicken and other white meat may be taken in moderation. Patients suffering from gout or gouty tendency sent to watering places for treatment are very much benefitted on account of the strict regime in food and drinks, regular exercise and massage.

During an acute attack the affected limb should be kept at rest elevated on a pillow and covered with cotton-wool. If the pain is very severe hypodermic injection of morphine may be necessary in  $\frac{1}{4}$  to  $\frac{1}{3}$  grain doses. Thirty minims of the wine of colchicum with 40 grains of citrate of potassium in a small wine-glassful of water may be given during the attack and repeated three times daily until the pain subsides. In chronic cases mixture number 71 is useful. Atophan, a synthetic drug, is effective in relieving the pain, two tablets of  $7\frac{1}{2}$  grains each may be taken to start with followed by one tablet thrice daily. This drug should not be continued for longer than three or four days as it is harmful to the liver. In chronic cases it might be taken for two days in the week and discontinued when not required. To relieve the congestion of the liver and kidneys which is present in gouty subjects, a mercurial purgative, such as the blue pill or calomel (No. 127) in four grain doses followed the next morning by a saline might be taken occasionally. To prevent the repetition of gouty attacks and for chronic cases dietetic and hygienic precautions are necessary.

## CHAPTER III

### DISEASES OF THE SKIN

The skin is liable to many diseases due to infection with micro-organisms, fungi or animal parasites and it would require a large volume to deal with them all. In this place a few diseases commonly met with are described.

**Acne.** Acne is a chronic inflammation of the minute glands in the skin secreting a greasy lubricating substance for the skin. It is found as pustules or papules most commonly on the cheeks and sometimes on the chest and back. It appears between the ages of twelve and twenty-five and is attributed to many causes but very often no cause is found. It is aggravated by poor health, uncleanliness, constipation, etc. The duct of the papule opening on the surface is choked with a small dark plug which could be squeezed out easily when ripe. There may be tiny drop of pus in the cavity which heals readily after the pus is removed but it recurs again. The area of skin surrounding the papule becomes inflamed if it is squeezed hard or prematurely and a large nodule is formed which is slow to heal and leaves a rough dark patch of skin.

General measures for the improvement of health, personal cleanliness, removal of constipation, etc., are necessary by way of treatment. Locally, the affected skin should be washed with soap and warm water and rubbed with a rough towel so as to promote local circulation. This could also be done by steaming the part for ten minutes three times a day. The face is exposed to steam over a basin containing hot water and rubbed after ten minutes with a towel. The plug when visible should be squeezed out with a squeezer specially made for the purpose and the point touched with 50% solution of carbolic acid in water with the point of a metal probe which is first passed through flame. A large pustule may require a tiny incision to remove the pus. Iron and quinine (No. 79) are beneficial in chronic cases.

**Baldness** (Alopecia). Baldness is a condition in which there is a total or partial loss of hair of the scalp. It may be temporary, as after certain infectious diseases or some local affection of the scalp, or it may be permanent. Ordinarily it is met with in old age, more commonly in males. The tendency to baldness is more or less hereditary and some persons lose their hair in young age. The loss of hair usually commences in front and gradually extends backwards leaving a semi-circular area of hair on the sides and back. It is attributed to many causes, such as thickening of blood vessels in old age which restricts the supply of blood to the scalp, peculiar formation of the skull which allows the headgear to press on the blood vessels of the scalp, infection of the hair roots by micro-organisms, etc. Too much use of soap on the scalp removes the natural lubricant and renders the hair brittle and liable to fall out.

In case of permanent baldness of old age and when the root is destroyed by fungus disease or injury no treatment is likely to do any

good. Temporary loss of hair in young persons after a severe illness requires no treatment except gentle massage of the scalp twice daily with some fresh vegetable oil, coconut or castor oil being very suitable for the purpose. In severe cases a mild irritating lotion (No. 44) or sulph. and salicylic ointment (No. 118) might be used once daily. Most of the costly hair restorers contain these ingredients, some are actually harmful and should be avoided. Much could be done to prevent premature loss of hair. The headgear should not be so tight as to obstruct the circulation, too frequent use of the soap for the scalp should be avoided as it removes the natural lubricant. Daily wash with warm water and vigorous rubbing with a towel and the use of a little fresh vegetable oil will keep the hair soft and in good condition. Any fungus disease of the scalp requires vigorous and prompt treatment.

**Boil.** A boil is an acute localized inflammation of a sweat gland or hair follicle in the skin resulting in a small area of necrosis or death of the tissues and a small abscess. It is caused by the infection of the skin by pus-forming micro-organisms, usually in debilitated persons. Boils are very common in children and have a tendency to recur every hot weather. There may be a single one or a crop of them in different parts of the body. It starts as a small red inflamed area which is painful on pressure or movement and which increases in size. After a time the centre softens and the skin over it becomes thin and gives way showing a white plug which comes out in two or three days and leaves a cavity which heals by itself readily if kept clean. Before it bursts it produces throbbing pain and a very uncomfortable feeling.

As boils usually occur in persons run down in health the treatment is to be directed in the first place towards remedying the original trouble. Children who are subject to boils should receive cod liver or other fish oil, milk, eggs, etc., and should have regular outdoor exercise. In the very early stage when the boil just begins to make its appearance it could be aborted by painting the part three times a day with tincture of iodine, glycerin of belladonna or 10% solution of carbolic acid. If this fails to arrest the progress the part should be kept clean and covered with a piece of cotton-wool and bandaged. Pain and discomfort could be relieved by dry fomentation. Poulticing should be avoided as it is apt to irritate the skin and produce pustules on the surrounding area. If the boil is superficial it will open by itself when the core can be removed by gentle pressure. Force should not be used as it is likely to cause the inflammation to spread and become more troublesome. The application of a plaster known as *Una's mercuric plaster mull* in the early stage is useful in aborting the boil, or in the late stage in hastening the process of suppuration and bursting. It is available at any chemist's shop or from any druggist in the bazaar. When the boil has opened it should be dressed with clean surgical dressing so as to guard against the infection from it to other parts of the body or any further infection of the raw surface from outside. If the boil is deeply situated it will require an incision to allow the contents to escape. Sulpha drugs and penicillin injections

are very effective against such pyogenic infections and are now much used.

The measures to prevent the recurrence consist in improving the general health, personal cleanliness, outdoor exercise, exposure to mild rays of the sun, administration of preparations containing vitamins, and tonics (Nos. 78 or 79).

**Carbuncle.** A carbuncle is a hard, painful and circumscribed inflammatory swelling of the tissues under the skin caused by an infection with pyogenic microbes. It is accompanied with more severe constitutional symptoms and usually attacks persons suffering from diabetes, chronic kidney disease or other conditions which lower the vitality of the body. It generally occurs singly and on parts of the body which are covered with thick skin, such as back, shoulder, nape of the neck and buttocks. When it attacks the face the condition becomes very serious. It commences as a slightly raised painful swelling which soon increases in size and may attain a diameter of six inches or more. The skin over it becomes dark red or brown and as the swelling increases in size it becomes soft and is covered with small pustules which burst and discharge a little thin purulent fluid and show a grey slough at the bottom. Many such openings are formed on the surface giving it a characteristic perforated appearance. In favourable cases the slough softens and comes out gradually leaving a clean healing surface which, after healing, leaves a large scar. Fever, aching limbs, headache and other symptoms of constitutional disturbance are present in proportion to the severity of the disease; these are very severe in old and debilitated patients in whom the chances of recovery are remote.

In the early stages when it is limited in size the application of tincture of iodine, glycerin of belladonna or a 25% ichthyol ointment may be effective in aborting it. If it fails surgical treatment would be necessary. The original trouble requires treatment at the same time. Sulpha drugs and penicillin have been found to be very beneficial if used early.

**Cheloid (Keloid).** In the ordinary process of healing of a wound the loss of the normal tissue is made good by the formation of fibrous tissue which makes the scar. But sometimes the scar tissue in the skin is excessive and a lump of hard fibrous tissue is formed. This often occurs in scars resulting from deep burns; certain individuals have a tendency to form such excessive scar tissue. Sometimes cheloids appear without any scar on the healthy skin, or a trivial injury might start it. It is mostly confined to the site of the wound but may spread beyond its limits. There may be no inconvenience from its presence except some unsightliness if it is on an exposed part of the body. It may disappear spontaneously after some months or years, but as a rule it remains stationary. Its removal by a surgical operation is of no use as it has a tendency to recur. Exposure to X-rays or radium has been beneficial in some cases.

**Chilblain.** Chilblain is an inflammatory condition of the skin brought about by exposure to cold of those parts of the body which are distant from the heart where the circulation is not very active. The hand,

fingers, toes, nose and ears are very liable to be affected, especially in children and debilitated persons. The affected part becomes pale and bloodless, the skin gets swollen, tender to the touch and painful. Itching or burning sets in and becomes so troublesome as to be unbearable. Desquamation of the skin follows and small flakes of the cuticle come off. In severe cases blistering takes place and the blisters contain thin clear or reddish fluid and may form troublesome ulcers which do not heal readily.

The exposed parts should be kept warm by rubbing them with the hand which stimulates the circulation in them. The extremities should be protected, when exposed to cold, by warm gloves and socks. Itching can be relieved by the application of mild tincture of iodine or a mixture of an equal quantity of Friar's balsam and camphorated spirit. General measures for the improvement of health are also necessary for those susceptible to the trouble.

**Corn.** A corn is a localized overgrowth and thickening of the epidermis, i.e., the outer layer of the skin, in the centre of which there is a horny peg or plug which presses on the sensitive papillae in the skin causing pain and discomfort. The usual sites where they grow are the outer side of little toe, upper surface of the other toes and the sole of the foot. It is produced by a moderate amount of pressure or friction, as ulceration occurs if the pressure is great. The most common cause is badly-fitting shoes, some persons being more liable to get it than others. It may be present without causing any trouble, but if subjected to pressure it becomes painful. It has a tendency to swell in damp weather.

The first thing to do in the treatment of a corn is to remove the pressure from the affected part. The corn is well softened with soap and warm water and pared carefully with a sharp instrument and a sufficiently thick ring of felt or some other soft material worn round the spot. If this is continued for some time it may disappear completely. A slow but more effective remedy is to paint the part thrice daily with a paint containing salicylic acid (No. 121) until the whole of it comes off. Further pressure on the part should be avoided.

**Drug Eruption.** Some drugs when taken internally or applied to the skin produce different kinds of rash, especially in susceptible individuals. It may be papular, i.e., raised above the surface of the skin, or macular, i.e., which is level with it; small ulcers may be formed sometimes. The drugs which produce eruptions are bromides, iodides, quinine, belladonna, iodoform, chlorine, salts of mercury, etc. These eruptions are liable to be mistaken for those found in some diseases. The appearance of the rash coincides with the administration of the drug and disappears soon after it is stopped, but may continue for some time. The treatment is to discontinue the drug for a time or reduce its dose; in bad cases it may be necessary to substitute some other drug.

**Eczema.** Eczema is an acute or a chronic inflammation of the skin produced by the application of some irritant to the skin of susceptible persons or may arise spontaneously without any appreciable cause. Those with a hereditary tendency and those suffering from diabetes, chronic

kidney disease or debility frequently suffer from it. No two cases run the same course, but it is ushered in by a sensation of itching or burning followed by redness and swelling. Later papules or small vesicles form which are broken by scratching and discharge clear fluid which may be profuse, in which case it is called *weeping eczema*. The exudation may stop after a time and dry crusts form on the surface. It may spread and involve a considerable surface and if it gets infected suppuration takes place and the patient is liable to convey it to other parts of the body. Mild cases subside within a few days and leave the skin in the normal condition.

The disease is sometimes very obstinate, especially in old persons and those suffering from diabetes, gout or chronic kidney disease. The cause of the trouble, if known, should be avoided and the diet should be plain and easily digestible, salted or tinned meat and fish, pickles and condiments should be eschewed. Strong drinks, beer, wines and strong tea or coffee are harmful. Old persons may take diluted spirit to stimulate the circulation. Barley water with fresh lemon juice or weak tea might be taken freely to stimulate excretion from the kidneys and saline aperients to encourage the action of the bowels.

There is no specific treatment for eczema but treatment on general lines is useful. The affected part should be kept clean and dry. The administration internally of ten minims of wine of antimony in a little water thrice daily is useful in reducing the inflammation in patients with high blood pressure. This is continued till the acute stage is over after which the dose is reduced to two minims. This is not suitable for persons with low blood pressure and debilitated patients. In case a considerable area is involved the patient should remain in bed as much as possible. Some chronic cases are benefitted by arsenic which might be given after food (Nos. 59 or 60).

In infants and children eczema results from uncleanliness, faulty diet, debility or some chronic disease. In case of breast-fed infants the mother's health requires attention and in artificially-fed infants the diet should be adjusted as described under rickets. The affected part should be protected against infection and irritating effects of cold, heat and the sun's rays. Before any application is made the dry crusts on the surface should be removed after soaking them with warm boric lotion or carbolic oil. Some skins are very sensitive to carbolic acid, in which case pure olive oil which has been boiled previously should be used. After this it is dressed with zinc and boric acid ointment (No. 120) which is evenly spread on a clean piece of lint. The weeping variety is treated with zinc and boric powder (No. 138) which is dusted on the surface. Mild cases are benefitted by washing the part with a solution of two drachms of tincture of iodine in a pint of warm water or 1% solution of carbolic acid or thymol lotion (No. 49). Calamine lotion (No. 41) for weeping eczema and lead and coal tar (No. 46) for chronic cases are useful in many cases. One remedy that does good to one patient may aggravate it in another.

**Favus.** Favus is a disease of the scalp caused by a fungus; other parts of the body may also be attacked. It causes permanent loss of

hair unless taken in hand very early. It occurs among children of poorer classes living under insanitary conditions. It appears as a small yellow disc on the scalp, the centre of which is pierced by a hair. It increases in size and forms a dark scab which falls off leaving smooth glistening surface devoid of hair and has a disagreeable mousy odour. Several such patches in different stages of development are present and involve the whole scalp if untreated. Cats, dogs, rabbits and mice are liable to suffer from it and may communicate it to human beings. From the scalp the infection is liable to be carried to other parts of the body unless proper precautions are taken. Early cases are amenable to treatment but the old ones are very obstinate and end in complete baldness.

As the patient is usually in a poor state of health his general condition needs attention to start with. The administration of cod liver oil and tonics and nourishing diet are necessary. As for the local treatment, the crust should be removed by softening it with carbolic oil which is applied several times during the day or a pad of lint soaked in the oil is kept constantly on the patch until it is soft and can be easily removed. The scalp is well washed after all scabs have been removed and then treated as for ringworm with chrysarobin ointment (No. 108), tar ointment (No. 119) in which 20 grains of chrysarobin per ounce are mixed or the white precipitate ointment containing 10 grains of salicylic acid per ounce. This treatment has to be continued until all signs of the presence of the fungus have disappeared which might take six months or so. It is of great advantage to remove all the hair from the scalp by X-rays before commencing the treatment.

**Herpes Simplex** and **Herpes Zoster** (Shingles). Simple herpes is a vesicular eruption of the skin, mostly of the face, lips, nose and chin. It occurs on the genitals and may involve the tongue also. It often occurs in many febrile diseases, such as pneumonia, cold, influenza, etc., but may occur without any cause. There is some burning at the site followed, after some time, by a crop of vesicles which dry up in a week or so and leave no after effects. The condition is apt to recur frequently.

Herpes Zoster or shingles is a much more severe condition and is accompanied with fever, general disturbance and severe burning pain which is very troublesome in old patients and interferes with sleep. It comes on without any apparent cause and may affect several persons at the same time. It occurs in persons taking arsenic or suffering from malaria or some other disease. The skin of the part affected becomes red and inflamed and is soon studded with closely set small vesicles. In mild cases these are small and dry up soon and the inflammation subsides without giving much trouble. The most common sites for it are the chest, abdomen and back. A person with herpes of the genitals is very liable to catch venereal infection if he exposes himself to it. After the healing of the vesicles some permanent scar is left.

For the simple variety very little treatment is necessary except to keep the part clean and dust it with zinc and boric acid powder (No. 138). For herpes of the external genitals zinc and boric ointment (No. 120)

may be used. Herpes zoster is treated in the same way and the part covered with a bandage. For the relief of pain and burning five to ten grains of antipyrin or powder No. 135 is useful. For sleeplessness and severe pain a dose or two of a sedative mixture (No. 87) might be taken when necessary and discontinued when not required. The administration of tonics, cod liver oil, iron and quinine (No. 79) and other measures for the improvement of general health are also necessary.

**Jigger or Chego.** The disease is caused by a minute parasite infesting the skin which is also known as sand-flea. It is found on the east coast and other parts of Africa, West Indies and some parts of America. It was once imported into India by labourers returning from Africa but fortunately it soon died out and no indigenous cases have been recorded. The female insect burrows under the skin, mostly of the leg, and causes trouble. There is a good deal of constant itching and burning aggravated when it lays its eggs. The insect comes out after ovulation but the itching does not subside and the skin ulcerates and suppurates. The treatment is to remove the insect from its burrow with a clean needle which is first passed through the flame of a spirit lamp. The parasite lives in dirt and dust and can be abolished by frequently cleaning the floors and treating them with strong phenyle lotion, or spraying with DDT solution.

**Leucoderma (Vitiligo).** Leucoderma is a chronic harmless condition of the skin in which the normal pigment is absent in small or large patches. It commences as a small white patch on some part of the body and slowly increases in size. Several such patches coalesce with one another and form larger areas. The skin round the margins is generally of a darker colour while the patch is quite white and glossy. Apart from the loss of pigmentation there is no trouble, the sensation in the skin and the secretion of sweat are normal. New patches appear on different parts and in course of years the whole body may be covered leaving a few dark patches. The hair of the affected part may also be discoloured. The trouble generally attacks better class persons between the ages of 25 and 40, being rare in childhood and after 45 and in poorer classes. Several members of the same family are affected though there is no evidence to show that it is hereditary. It is more common in the tropics than in cold countries. Popularly it is called white leprosy but it has nothing in common with that dreadful disease and is not contagious nor communicable to others. It does not affect the general health, being more a disfigurement than a disease. So far no cause has been found though many theories have been advanced.

As no definite cause has been discovered it is not possible to treat it on rational lines. Many remedies have been tried at random but so far no specific has been found. Change to a cold climate when the trouble has just started has been beneficial in some cases, but complete cure is rare. The administration of large doses of alkali salts, such as bicarbonate of sodium, light oxide or carbonate of magnesium, etc., have been recommended to neutralize excessive secretion of acid in the stomach. One drachm of the bicarbonate or ten to fifteen grains of the light oxide or carbonate of magnesium in half a tumblerful of

water might be taken twice daily for some weeks. All spicy and indigestible food and acid fruits should be avoided and constipation, if present, should be treated. Many stains, such as walnut juice and solution of permanganate of potassium, are used to conceal the disfigurement.

**Pemphigus.** Pemphigus is a disease in which small blisters appear on the face, limbs and other parts of the body with some disturbance of health. They may be few and scattered or very profuse and confluent and in severe cases may invade the mucous membrane of the mouth also. Newly born infants, children and growing persons are liable to get it, while it is rare among adults. In the new-born it runs a severe course and may be fatal. So far nothing is known as to its cause and the previous condition of health seems to have no influence on the disease. In some cases there is a hereditary tendency as several children in the same family are attacked by it. In infants and children there is some disturbance of health with fever. The blisters appear simultaneously on different parts of the body, small at first, but increase in size within a few hours. They dry up after a few days and the scab falls off leaving a discoloured patch. Successive crops keep on coming and may do so for months. In severe cases bleeding takes place in the blisters and sloughing or gangrene may result.

The affected parts should be kept clean and free from infection by washing them morning and evening with an antiseptic lotion and dusted with zinc and boric powder (No. 138) and covered with clean gauze and bandage. The administration of arsenic alone or combined with quinine is beneficial. For this purpose mixture No. 60 might be given thrice daily after food and the dose of arsenic in it increased gradually to eight to ten minims for an adult; children should receive proportionately smaller doses. Measures for the improvement of the general health are also necessary.

**Prickly Heat** (Miliaria). Prickly heat is an acute inflammation of the sweat glands in the skin caused by excessive sweating in hot weather in the tropics. Fat persons and those who perspire freely as also those who indulge in excessive protein diet are very liable to get it. Every one who has lived in the tropics is familiar with the symptoms. There is intense irritation or itching of the skin which may be very distressing at night and might interfere with sleep. The skin becomes red and shows minute closely set transparent vesicles or red papules which may continue throughout the hot weather or may disappear partly or completely for short intervals. It is aggravated by the use of alcohol, rich protein diet, spices in food, excessive exercise, constipation or exposure to the sun. Scratching may result in boils or sores from infection.

The diet, especially during the hot weather, should be plain, non-stimulating with very little meat and plenty of vegetables. Frequent saline aperients should be taken to keep the bowels free. Alcohol, excessive exercise and exposure to sun should be avoided and plenty of water or barley water taken. Hot bath relieves the irritation and

should be taken before going to bed. Plain unscented soap should be used for cleaning the skin, bar soap of any good make is the best for the purpose. Scratching should be avoided as much as possible; the excessive irritation can be relieved by gently rubbing the part with a clean piece of gauze soaked in corrosive sublimate lotion (No. 47) which will prevent the infection of the skin also. Prickly heat powder (No. 140) dusted on the affected parts is useful in allaying the irritation. Change to a cooler place cures the trouble immediately.

✓ **Ringworm.** Ringworm is a contagious disease caused by a fungus growing in the superficial layer of the skin, the hair or the nails. One variety common in the tropics affects the armpits and groins. This is commonly called *dhobi's itch* although the much-maligned Indian washerman is hardly responsible for it. Ringworm appears on the skin in patches of various sizes. A well developed patch is slightly darker than the surrounding area, has an irregular wavy margin and is covered with very fine scales. In the armpits and groins it has a much darker colour and is confined to the folds of skin in contact with one another and wet with sweat. Itching is troublesome and may be constantly present and worse at night when the patient is warm in bed.

Ringworm of the nails is an obstinate disease and may occur independently of the skin affection and may affect a single nail or all the nails of one or both the hands at the same time. The affected nail is discoloured, becomes brittle and breaks easily. Ringworm of the scalp is peculiar to children and is rarely found in adults. It appears in patches of  $\frac{1}{2}$  to 1 inch in diameter which are covered with thin scales or dandruff and are of a dirty grey colour. The hair breaks near the scalp leaving a small stump behind.

If the skin is inflamed and painful the first thing to do is to remedy this. The part is well washed, dried and dusted with zinc and boric powder (No. 138). After the inflammation subsides the part is painted with tincture of iodine two or three times daily until the whole epidermis comes off. This is sufficient to effect a cure. Iodine is not suitable for use on some delicate skins which can be treated with chrysarobin ointment (No. 108) well rubbed on the affected part. Chrysarobin stains the skin and clothes which is a disadvantage. Paint No. 122 is also very useful in ordinary ringworm of the skin. The moist variety of ringworm is best treated with an ointment containing white precipitate and salicylic acid (No. 113). The ringworm of the scalp is now treated successfully with X-rays which does not kill the fungus but removes it with the hair. Where X-rays are not available, the hair of the affected part is pulled out one by one and the area painted with tincture of iodine or one of the ointments mentioned above. The ringworm of the nail is more troublesome and requires patience and perseverance. The affected nail is scraped with fine pumice stone and painted with strong tincture of iodine or soaked several times during the day in a solution of sodium hyposulphite containing 90 grains to an ounce of water.

**Scabies or Itch.** Scabies is a disease of the skin caused by a minute

animal parasite which burrows in the superficial layer of the skin. It is conveyed to healthy persons by direct contact with the patient or the clothes used by him. The female penetrates the skin for a distance of  $\frac{1}{8}$ th to  $\frac{1}{2}$  an inch before it lays its eggs, the point of entrance showing a small vesicle or a pustule. It usually selects a site where the skin is soft and thin, such as the webs between the fingers, the skin of the abdomen and the genitals. The chief symptom of scabies is intense and constant itching of the affected part and sometimes of distant parts also. Septic infection of the skin takes place from scratching and produces pustules, boils and ulcers which are more troublesome than the original complaint. The tiny point of entrance and the burrow are visible with a magnifying glass.

Till very recently the official sulphur ointment was the only remedy used, but the treatment with it is slow and tedious. In recent cases with limited infection it is possible to open up the burrows with a clean needle and remove the parasites. The treatment with sulphur has to be continued for three weeks before all the parasites are destroyed. Flowers of sulphur mixed with a little coconut oil to which a little kerosene oil is added is a very effective household remedy used in India. Mitigal, a liquid preparation of sulphur, is quicker and less messy than sulphur ointment. It is well rubbed on the affected skin and allowed to dry, the part is washed after eight hours and a second application made after a week. Recently a preparation called benzyl benzoate is used very successfully. A mixture containing equal parts of this, soft soap and rectified spirit is used as an application. After a warm bath the body is well scrubbed and the preparation well rubbed all over the body except the face; a further application is made when the body is dry and no bath taken for twenty-four hours. Ready-made emulsion of this preparation is available under different trade names which can be used as above. All clothes and bed-clothes used by the patient should be boiled or treated with dry heat.

**Ulcer.** Ulcer is a generic term applied to an open sore caused by necrosis or death of the skin or mucous membrane from any cause. Many kinds of ulcer have been described according to the cause, viz., simple, when it is caused by an injury, burn, etc., tuberculous, when due to tubercular disease of the part, varicose, when due to ulceration of a varicose vein, syphilitic, when due to syphilitic disease, malignant, when due to cancerous disease of the skin, etc. A simple ulcer heals readily if kept clean and free from infection. The appearance of an ulcer, its tendency to heal or spread and other characteristics differ and depend on the cause.

A simple ulcer is cleaned with some antiseptic lotion and covered with a piece of clean lint or gauze and bandaged. A healing ulcer looks clean and is free from pus or slough and is covered with healthy granulations, i.e., small pink or reddish fleshy points which bleed slightly when rubbed, its margins are greyish blue in colour and sloping. The healing commences at the margins and extends inwards. If the process of healing is retarded and the surface is covered with gelatinous mass it is touched with sulphate of copper or pure carbolic acid.

Constitutional or other disease responsible for the ulcer requires suitable treatment in addition to the local treatment described above.

**Warts** (Verruca). Warts are small growths from the superficial layer of the skin which are classified according to their size, shape, appearance, situation and cause. The common variety is mostly found on the hands as a small sessile growth, rough on the surface with small coarse projections and may be single or multiple. The senile variety is found in old persons; it is large and multiple on different parts of the body. That on the scalp has long finger-like processes. Those known as venereal warts grow on the genitals in both the sexes, are reddish in colour and like cauliflower in appearance. They are produced by the irritation of the discharge, but such warts are sometimes found in persons who have had no venereal disease. Pregnant women are liable to get them, in whom they disappear spontaneously after confinement. The butcher's or post-mortem wart is seen on the hands of medical men, butchers, mortuary attendants, cooks and those who have to handle dead bodies or carcasses of animals. It is due to an infection with tubercle bacillus. As a rule warts produce no symptoms unless they are large and interfere with the performance of some function. In old persons they may be the starting point of a cancerous growth in the skin.

A small wart can be easily destroyed by the application of a caustic, such as glacial acetic acid, nitric acid, carbolic acid or a strong solution of salicylic acid in alcohol. This treatment is not suitable for old subjects. A large wart requires removal with a pair of scissors. Salicylic acid paint (No. 121) applied to it twice a day for some days is effective in completely removing it. While applying a caustic the skin surrounding the wart should be protected by painting it with a thick layer of vaseline. Some cases are benefitted by the internal administration of thirty grains of sulphate of magnesium in water three or four times a day. The post-mortem wart is best destroyed with an electric cautery or excised with a knife.

## CHAPTER IV

### COMMUNICABLE DISEASES

Communicable diseases are those which are caused by minute micro-organisms or bacteria which can be conveyed from a diseased to a healthy person. Formerly these diseases were known either as infectious when they were transmitted through the atmospheric air, or contagious when spread from person to person by direct contact. But these terms do not always describe the condition accurately, as some diseases are conveyed through the air as well as by direct contact, while many diseases are now definitely known to be conveyed by insects. For this reason the term infectious is commonly used for all such diseases, though the term communicable diseases is more accurate and is now frequently used.

The bacteria are introduced into the body in microscopic quantities, but they grow very rapidly, as the conditions are very favourable for their existence, the blood-serum being a very rich nutritive fluid and the body temperature is just right for them. The symptoms of the disease do not appear immediately the bacteria are introduced into the system and not until they have multiplied sufficiently to produce enough toxin to produce a reaction. The time between the infection and the appearance of first symptoms is known as the *incubation period* which varies in different diseases and within certain limits for the same disease and depends on the severity of infection and the state of health of the person infected. The period of quarantine for persons coming from an infected locality is determined according to the longest incubation period known for the particular disease. Some few infectious diseases confer permanent immunity to the patient while others give temporary immunity.

**Actinomycosis.** It is a chronic infection caused by a fungus known as ray fungus on account of its radiating appearance when seen under the microscope. It is met with chiefly in cattle, horses and pigs. In cattle it causes *lumpy jaw* and *wooden tongue*. In human beings the infection is conveyed by chewing raw grains or straw containing the fungus. It enters the body through a scratch or wound in the mouth where it grows and spreads to the adjoining parts. It may affect the respiratory organs through the dust raised in threshing the corn. The soft parts near the jaw become hard and lumpy and the skin over them shows small hard swellings which are painless in the beginning, but later on these break down and discharge pus when the pain is severe. The discharge contains small yellowish granules known as sulphur granules.

When the stomach or the bowels are affected the symptoms are pain in the abdomen, nausea, loss of appetite and vomiting; there may be persistent diarrhoea or sometimes constipation. The infection of the lungs simulates tuberculosis of these organs, there being cough, pain in the chest, fever, expectoration of muco-pus or blood, and difficulty of breathing. The yellow granules may be present in the

sputum. When the abdominal organs are attacked the diagnosis is not easy and an exploratory operation may be necessary to determine the cause of the symptoms. The detection of the fungus in the sputum on microscopic examination will confirm the presence of the disease in the lungs.

**TREATMENT.** When a small superficial area is affected it may be possible to remove it surgically, but when the lungs or the abdominal organs are involved the chances of its extirpation are remote. The administration of penicillin at a very early stage and before the fungus gets a strong foothold and invades bones and important structures is effective in arresting the disease. The sores caused by it should be cleaned and dressed with antiseptics.

**Ague.** See Malaria.

**Anthrax** or Woolsorters' Disease. It is an acute infectious disease of herbivorous animals caused by a specific micro-organism which is transmissible to human beings as also to other warm-blooded animals. Sometimes it breaks out in an epidemic of a limited extent in persons who come in contact with animals or are engaged in handling hides, bones, hair or carcasses of animals, such as shepherds, woolsorters, butchers and others. In animals the infection spreads mostly by grazing on contaminated pastures. Isolated cases in human beings have occurred from the use of infected horse-hair shaving brushes. In man the incubation period is from 3 to 4 days.

In human beings the disease usually appears on the skin, sometimes in the lungs and rarely in the intestines. On the skin it is initiated by intense itching which is soon followed by a small papule which becomes a vesicle filled with a little fluid. This dries up and a small dark brown or black scab or slough is formed surrounded by a dark swollen area covered with similar vesicles; this is known as the malignant pustule which tends to spread in every direction. In the beginning there is hardly any pain and very little general disturbance, but within 3 or 4 days the bacilli are disseminated throughout the body setting up a severe toxæmic condition which terminates in death. The temperature rises a little but may be normal or subnormal. It gives no indication of the seriousness of the condition. A characteristic peculiarity of the disease is the extraordinary tranquillity of the patient even when his condition is extremely dangerous. If the case is not treated in time it rapidly gets worse and ends in death within 8 days from the commencement. In cases that recover a deep disfiguring scar is left.

The anthrax of the lungs is a very serious disease. There are no external signs and the patient's condition does not seem to be bad at all and he feels well until a few hours before death. There is a feeling of tightness about the chest with cough and difficulty of breathing. The disease proves fatal within 5 days. Intestinal form of anthrax is very rare in human beings and is produced by swallowing the bacilli. There is nausea, vomiting, pain in the stomach and bloody diarrhoea. Like the anthrax of the lungs it is also a dangerous disease because it produces intense toxæmia before it is recognised.

The cutaneous variety is very amenable to treatment provided it is recognised early and prompt measures adopted, but if it is allowed to develop for 3 or 4 days or if the pustule is unnecessarily meddled with and strong disinfectants applied to it the infection is very liable to be disseminated into the system causing fatal septicaemia.

**TREATMENT.** The patient should be put to bed and his strength kept up by light nourishing diet. The pustule should not be meddled with nor treated with strong chemicals but should be covered with a clean piece of lint or gauze. The specific treatment consists in administering intravenously 50 to 150 c.c. of anti-anthrax serum (Sclava's Serum) and repeating smaller doses of it every four hours for the next 24 hours. Recently sulphapyridine and penicillin have been used with great success in the treatment of this disease. To be effective these should be used at a very early stage.

As an occupational disease the preventive measures against it are taken by the Public Health authorities. As an individual precaution any material likely to harbour the infection should be avoided, especially cheap horse-air shaving brushes. The spores of the bacilli remain alive for a very long time in a dried condition and are not easily destroyed. The suspected article should be boiled for 20 minutes or kept in a strong disinfecting fluid for several hours, such as perchloride of mercury lotion, 1 in 1,000, or a mixture of equal parts of formalin and water. All dressing materials used on the pustule should be burnt.

**Blackwater Fever** or West African Fever. The name of the disease is derived from the very dark or black colour of the urine of the patient on account of the presence of haemoglobin in it of the red blood-corpuscles which are destroyed. The disease is prevalent in badly-infected malarious localities, as in Assam and parts of Bengal and Madras, in tropical West Africa and Panama Canal Zone. A great majority of patients have had frequent attacks of malaria. It is very likely there is some other unknown factor which acts in the presence of malaria.

The disease is ushered in by an attack of severe chill which is very depressing and weakening. It is soon followed by a rise of body temperature which is not always very high. The patient looks very ill and has bilious vomiting, jaundice and great depression. The urine is very dark and scanty, but as the attack subsides it regains its natural colour and increases in quantity. The attacks recur at short intervals like malaria and leave the patient weaker and more depressed than before. The mortality rate is high among patients who are run down by malaria and among those who are not properly treated.

**TREATMENT.** The patient should take to bed at once and have complete rest. As quinine precipitates or aggravates an attack it should not be taken unless ordered by the medical attendant. He should take plenty of liquids, such as milk, milk and soda water, barley water, weak tea or coffee, etc. If the vomiting is persistent these should be taken cooled and in small quantities at a time. An effervescent saline draught or an enema is administered to relieve constipation.

Violent purgatives should be avoided as also alcoholic stimulants except under medical advice. The patient should leave the locality as soon as he is able to travel.

Persons residing in an endemic area should take all precautions against malaria and avoid irregular habits and any cause likely to affect their health unfavourably. A patient who has recovered from the disease should remain away for at least six months.

**Cerebro-spinal Fever** or Spotted Fever. It is an acute infectious disease caused by a specific micro-organism. There may be a few isolated cases or a localised epidemic among individuals who are crowded together in insanitary buildings or jails, barracks and camps. The micro-organisms are found in the upper air-passages of some healthy persons who are capable of spreading the disease without themselves suffering from it. Such persons are known as carriers. Primarily, the infection involves the nose and throat from where it enters the blood and produces a severe inflammation of the meninges, i.e., the coverings of the brain and the spinal cord. It is also called spotted fever on account of the eruption of dark-red spots on the body. The incubation period is from 2 to 8 days.

The first symptoms are nasal or pharyngeal catarrh, tonsillitis and redness of the conjunctivae. The patient soon becomes dull, apathetic, resents being disturbed and lies in bed with eyes shut, legs drawn up and the head bent forward. The temperature rises to 103 or 104. Very soon small dusky red or dark spots varying in size from a pin-point to half an inch in diameter appear on the skin or mucous membranes. These fade after 3 or 4 days leaving a rusty stain. The head retracts, the neck becomes stiff and the patient has chilly feeling. The condition steadily deteriorates unless prompt and proper treatment is administered. In the malignant or fulminating type the onset is quite sudden with extensive bleeding under the skin, and death may take place within a few hours. In cases that recover improvement sets in between the eighth and the fourteenth day and the progress is slow. Recrudescence of symptoms might take place before complete recovery. In the early stage the disease is likely to be mistaken for influenza or common cold.

**TREATMENT.** The patient should be immediately put to bed in a quiet, dark, well-ventilated room and should not be disturbed unnecessarily. The specific serum is administered intravenously within 24 hours of the onset and repeated every 8 or 12 hours according to the severity of the case. The longer it is delayed the fewer the chances of recovery and the delay of a few hours may turn the balance against the patient. Recently the sulpha compounds known under different trade names have proved to be very efficacious, not only in reducing the mortality rate, but also in cutting short the attack. These are to be administered systematically and are apt to produce very unpleasant symptoms if proper precautions are not taken; they should be used under medical instructions. Penicillin administered early is very useful in cutting short the disease.

The infection is found in the secretion of the nasal and pharyngeal

cavities and is conveyed from person to person through the fine spray blown into the atmospheric air by coughing, sneezing or shouting, such contaminated air should be avoided as also visits to places of public entertainment or where there are large gatherings during an epidemic. Healthy carriers might convey the disease to others, particularly children, through kissing.

**Chicken-pox** or Varicella. It is an infectious disease of childhood with very mild general symptoms and small vesicular eruption on the skin. The nature of the infection is not known but the liquid contents of the vesicles can transmit the disease. Most children get it before the age of 12 and those that escape are liable to get it in adult life. One attack gives immunity for life and repeated attacks are very rare. It is contagious from the very beginning and remains so till the eruption is dry and all scabs have fallen. The usual period of incubation is 14 days but may be as short as 4 and as long as 27 days.

In children the symptoms are mild and the eruption is the first thing noticed but in adults fever, headache, aching of the limbs and back, and loss of appetite precede the eruption. Small groups of tiny papules are first seen on the trunk from where they spread to the face and limbs; these are soon converted into vesicles containing a little clear fluid. The vesicles soon dry up and the thin scabs come off leaving no scar unless the part is scratched and infected with septic micro-organisms. In children it is sometimes mistaken for small-pox, but unlike small-pox there are no constitutional symptoms and the eruption soon dries up leaving no scars.

**TREATMENT.** No special treatment is necessary beyond ordinary hygienic measures. The child should be prevented from scratching the vesicles. The itching is relieved by washing the part with boric lotion or the application of zinc and calamine lotion, No. 41.

**Cholera.** It is also known as Asiatic cholera on account of its prevalence in Asiatic countries. It breaks out periodically in widespread epidemics where sanitary arrangements are defective and the water-supply unprotected and liable to contamination. The microbe responsible for it grows in the intestine of the patient and is copiously present in the stools. The infection is chiefly carried in drinking water. The presence of the microbe alone in the intestine is not always enough to produce the disease as some individual predisposition is necessary. This may be brought about by irritation or catarrh as happens after eating indigestible food, unripe or over-ripe fruit, exposure to chill or over-exertion. In cities provided with purified drinking water the disease in the form of widespread epidemics has been abolished. In famine-stricken areas and large pilgrim centres where sanitary arrangements are defective it takes a very heavy toll of human life. Its incubation period is from 3 to 6 days but may be as long as 10 days and in severe epidemics it is a few hours only.

The disease is ushered in by diarrhoea which lasts for a few hours or a day; it soon increases in severity and is accompanied with persistent vomiting. Violent vomiting and purging may come on together bringing about collapse and death within 24 hours in the fulminating type of the

disease. The faecal contents of the bowels soon change and the stools become thin, watery and greyish white in colour and are known as rice-water stools of cholera. The body tissues are denuded of their normal fluid by persistent diarrhoea and vomiting which brings on a train of symptoms, viz., sunken eyes, cold bluish skin, cramps in the limbs and other parts of the body, subnormal temperature, suppression of urine, thin small pulse and loss of voice. This state of collapse may end in death or in about half the number of cases reaction sets in with the cessation of the severe symptoms, the return of warmth and natural colour of the skin, secretion of the urine and sleep. The reaction does not always terminate favourably and in some cases the temperature rises, the secretion of the urine stops completely and the patient passes into a low state of vitality and dies. The severity and virulence of the disease varies in different epidemics; some epidemics are very mild with a low mortality rate. As a rule the disease is not very virulent in the beginning and end of an epidemic. In a particularly virulent form, which is known as *cholera sicca* or dry cholera, the toxæmia is intense from the beginning and death takes place within a very short time and before vomiting or purging sets in.

Poisoning by salts of heavy metals, such as mercury, arsenic, antimony, etc., and ptomaine produce symptoms which simulate cholera, but in such cases vomiting precedes diarrhoea, rice-water stools are absent and there is no epidemic in poisoning though several cases may occur in one house. The possibility of cases of poisoning occurring during an epidemic of cholera should be remembered.

**TREATMENT.** Cholera is a dangerous disease of short duration with sudden development of dangerous symptoms and special technical skill and experience are necessary for its efficient treatment, it is therefore very imperative in the interest of the patient to obtain very early medical help or transfer him to a hospital where all arrangements exist for carrying out the modern treatment of cholera which alone can increase the chances of his recovery.

The patient should be at once put to bed and covered with light warm blankets and should not be allowed to get up to pass stools or urine but should be given urinal and bedpan. If he is much exhausted he should not be disturbed with the bedpan but some carbolised tow or cotton wool used for packing the buttocks. This should be removed and burnt when soiled. The stools contain the microbes in very large numbers, every care should therefore be taken to prevent the infection from spreading to healthy persons. The contents of the bedpan and urinal should be immediately mixed with some strong antiseptic solution and allowed to remain in contact with it some time before disposal.

No solid food is given to the patient but small quantities of fluids, such as whey, weak tea without milk, barley water sweetened with glucose or soda water in small sips may be given frequently. Astringent medicines, especially those containing opium, for stopping diarrhoea or vomiting are not only useless but are harmful. Vomiting and purging are nature's attempt to rid the body of the toxin. The lost fluid from the tissues is replenished by intravenous injections of large quantities

of saline solution containing 120 grains of sodium chloride and 4 grains of calcium chloride in a pint of water at body temperature. Three to four pints of this are injected into a vein and repeated as required. The immediate effect of the injection is striking; the patient's general condition improves, the pulse becomes full, the blood-pressure rises, the colour and the warmth of the skin return and the patient feels comfortable. Unfortunately, in a large majority of cases this improvement does not last long and the symptoms return requiring repetition of the injection. In the absence of arrangements for intravenous injection the saline is given subcutaneously, but the effect is much slower and not so marked. It is given in the armpit or under the skin of the abdomen.

During the stage of collapse alcoholic stimulants may be given in small quantities. Two to four teaspoonfuls or more in case of patients used to alcoholic drinks may be given mixed with a little warm water at frequent intervals. Large doses of alcohol should be avoided on account of the depressing after-effects. In some parts of the State of Bombay spirits distilled from fermented toddy was at one time used as a remedy for cholera, but this is not available now as distillation of spirit from toddy juice is prohibited. In order to neutralize the toxin formed in the intestine potassium permanganate in small doses is given. A pill containing 1 to 2 grains is given every half hour for the first two hours then every hour until the colour of the stools changes to dark green. The pill is coated with a substance called keratin which dissolves in the intestine and liberates the drug to act there. A dilute solution of the drug containing 2 grains to a pint of water is given to sip frequently instead of the pill. Calcium permanganate is also used in the same way.

For painful cramps massage and hot fomentations with flannel are beneficial. For severe collapse 5 minims of tincture of digitalis with a little brandy in warm water is given and repeated after two or three hours if necessary. For the suppression of the urine hot fomentations and dry cupping on the loins and plenty of fluids by the mouth should be tried. Twenty grains of bicarbonate of soda in water or barley water is also given frequently. No attempt should be made to stop the diarrhoea completely during the suppression of the urine, as during the inaction of kidneys the waste products of the body and the toxin are removed by the bowels. Bacteriophage or minute ultra-microscopic bodies suspended in a liquid are administered by the mouth to destroy cholera microbe. Penicillin has no effect on cholera, but it is possible similar preparations from other fungi, which are being investigated might be found effective.

It is very advisable to undergo protective inoculation against cholera when an epidemic threatens or breaks out, as it is the only reliable method of prevention. The immunity afforded by it lasts for about 12 months which is long enough to carry one through an epidemic which rarely lasts longer than six weeks. All drinking water and milk should be well boiled before use and all articles of food efficiently protected against contamination by flies or a carrier. No servant who

has recently recovered from cholera should be employed or allowed to handle food until he is examined by a bacteriologist and declared free from infection. During an epidemic raw vegetables, unless well washed in a strong solution of permanganate of potassium, should not be used. Exposure to cold, over-exertion, alcoholic excesses, violent purgatives, unripe and over-ripe fruit and overloading the stomach should be avoided. Persons coming in contact with cholera cases should be careful to disinfect their hands thoroughly. All clothing, bed-sheets, towels, etc., used by the patient should be boiled or soaked in strong antiseptic lotion.

**Consumption.** See Tuberculosis.

**Dengue** or Breakbone Fever. It is an acute infectious disease transmitted by the mosquito; the nature of the infection is not known. The incubation period is from 3 to 9 days. The onset is sudden with severe pains in the limbs, joints and back accompanied with headache and fever. The patient becomes restless and much exhausted and complains of pain behind the eyeballs. In children the attack is ushered in by delirium or convulsions. The temperature rises to 103 or more and the pulse rate to 100 to 140 per minute. The pain is aggravated on movement. These symptoms continue for 3 or 4 days when the temperature falls suddenly or gradually, the pulse rate becomes normal, the secretion of urine increases and the patient feels better, but the pains continue. After an interval of 2 or 3 days all the symptoms recur but the temperature does not rise to the same height as before. With the recurrence of fever a rash appears, at first on the back of the hands then on the arms, face, neck and the rest of the body. It consists of small red spots which join together and form larger patches. Sometimes the rash is very faint or absent and is not visible on dark skins. Bleeding from the nose might take place but it is not troublesome. The recrudescence of the symptoms continues for 2 or 3 days, the total duration of the disease being a week. The convalescence is short and no ill effects are left behind. The disease though painful is not fatal.

**TREATMENT.** There is no specific treatment for dengue and the treatment aims at relieving the symptoms. For the relief of pain and headache aspirin and caffeine powder (No. 135) is beneficial, it might be repeated, if necessary, after 4 hours, but more than 3 powders during 24 hours should not be taken. Salicylate of sodium (No. 85) may be given for pain and fever. Calomel, 1 to 3 grains, or sulphate of magnesium, 120 to 360 grains, according to the age of the patient, is given in the beginning of the attack to clear the bowels.

As the disease is transmitted by the mosquito, all precautions against its bite should be taken as described under malaria. One attack does not give immunity for long, but subsequent attacks are mild.

**Diphtheria.** It is an acute infectious disease caused by a specific microbe. It attacks the mucous membrane of the throat, larynx and the nasal cavities and is accompanied with severe constitutional disturbance, great prostration and serious complications. The incidence of diphtheria is greatest in childhood though no age is exempt. It is usually found in an endemic form in large cities and periodically breaks

out in an epidemic form, especially during the colder months in autumn and winter. It is more common in cold and temperate climates than in the tropics. The microbe is disseminated in minute droplets expelled with the breath while coughing, sneezing, spitting or speaking. It may also be conveyed in food and milk. Clothing, toys or other articles contaminated by a patient retain the infection for a long time. Children who are carriers are often responsible for an outbreak at school. The incubation period is from 2 to 5 days.

The initial symptoms may be very slight and the disease develops gradually or the onset may be quite sudden. In the beginning there may be a little soreness of the throat and a little rise in the temperature. The soreness may be absent or so slight as to escape notice, especially in young children. It is therefore a good rule to examine carefully the throat of every child suffering from indefinite symptoms so as to detect the presence of the disease at a very early stage when it is amenable to specific treatment. The child loses appetite, becomes peevish and complains of headache and pain in the limbs. In older children and adults sore throat is the more prominent symptom. The mucous membrane of the throat and tonsils is red and inflamed and soon gets covered with a thin greyish white film which is called the false membrane. It is loosely or firmly adherent to the underlying part which bleeds when the membrane is removed with a pair of forceps, and soon gets covered with similar film. It may extend to the soft palate and into the nasal cavities. Vomiting is present and the child has some difficulty in swallowing. The spread of inflammation to the larynx causes obstruction to breathing and may call for an urgent operation on the windpipe to allow the child to breathe through the artificial opening otherwise fatal asphyxia is very likely to result. The membrane remains for a week but if the case is given early specific treatment it disappears sooner. The temperature does not rise very high and is not in proportion to the severity of the disease and in bad cases it may be normal or sub-normal. The pulse is weak and rapid and may be irregular and imperceptible.

Many serious complications may arise during the course of the disease or soon after the acute stage is passed; of these broncho-pneumonia is frequent when the larynx is involved and affects very unfavourably the chances of recovery. A late and troublesome complication is the paralysis of muscles, the most commonly involved being those of the palate which becomes flaccid and is unable to shut off the pharynx from the nasal cavity during the act of swallowing so that food, especially liquid, passes into the nasal cavity instead of passing into the gullet; the voice also acquires a nasal character. The muscles of the eyelids and the eyeball may be affected causing inability to move these parts. Paralysis of the muscles of the extremities causes difficulty in locomotion. The involvement of the heart muscle is a dangerous complication and may cause death at a very early stage from heart failure. With proper treatment the paralysis disappears in a large majority of patients.

**TREATMENT.** It is very important for saving the life of the patient

and preventing dangerous complications to administer the specific treatment at a very early stage and before any serious damage is done. For this purpose it is imperative to diagnose the disease as soon as possible as the delay of a few hours may turn the scales against the patient. Diphtheria very often simulates some trivial and harmless complaint and the earlier symptoms, particularly in children, do not point to the throat or larynx; the presence of the disease is, therefore, not suspected until it is too late. For this reason in every case of illness in children when the symptoms are indefinite with rise of temperature, the throat should be very carefully examined and in case of any signs of inflammation a smear on a clean swab of cotton wool from the inflamed mucous membrane should be taken for bacteriological examination as this is the only certain method of diagnosing the disease in the early stage. In the meantime the treatment should commence, because no harm will be done if the result of the examination is negative, while if it is positive the early commencement of the treatment would be of great benefit.

The patient should be put to bed and prevented from undergoing the least exertion. The diet should be liquid; milk, whey sweetened with glucose, or milk with an egg beaten in it, and thin broth may be given. Nasal feeding may be necessary if the child is unable to swallow. The specific treatment consists in administering subcutaneously 6,000 to 8,000 units of antidiphtheria serum according to the severity of the case irrespective of the age of the child. If the treatment has been delayed a much larger dose, viz., 15,000 to 30,000 units, will be required to be injected intravenously. It may be necessary to inject the same or a smaller dose after 24 hours if the symptoms do not abate. The favourable effects are noticeable within 24 hours as could be seen from the improvement in local and general symptoms; the inflammation begins to subside, the false membrane gets loose and the patient looks comfortable. Some patients, who are sensitive to serum, develop serum sickness (*q.v.* page 72, Part I). Before the discovery of penicillin this was the only effective treatment for diphtheria, but penicillin has been found to be just as efficacious if not more and is now freely used, especially when fresh serum is not available. Local treatment for the throat is not necessary if the serum or penicillin is injected in time. The mouth and throat should be cleaned and swabbed with carbolized glycerin several times during the day. A weak solution of permanganate of potassium might be used in case of adults and older children for gargling. In laryngeal diphtheria if there is the least sign of obstruction to breathing an early operation on the windpipe for a temporary opening in it to enable the patient to breathe through it, is indicated and the earlier it is done the better for the patient, as he is then better able to stand the operation; moreover, a complete obstruction may suddenly occur at any moment and kill the patient before anything could be done.

The microbes of diphtheria are disseminated through the fine spray produced while coughing, sneezing, etc., through kissing or through articles used by a patient. All infected articles should be burnt or

soaked for a prolonged period in a strong antiseptic lotion. Children exposed to infection should be protected by the injection of the prophylactic serum. The disease is not very common in India and epidemics are not known except on a limited extent in school children.

**Dysentery.** It is a term applied to an inflammatory condition of the large intestine characterised by frequent stools containing blood and mucus, painful straining and general constitutional disturbance. It may be acute of short duration or chronic lasting for months. The inflammation of the large intestine with symptoms resembling those of dysentery is caused by many other conditions, but true dysentery is due to an infection of the intestine either by a specific bacillus when it is known as bacillary dysentery, or by a microscopic unicellular animalcule called amoeba in which case it is known as amoebic dysentery. The chief source of infection is the faeces of the dysenteric patient or of a carrier who is capable of harbouring the infection for a very long period. Flies are responsible for carrying it from faeces to food. Individuals in good health are capable of resisting the infection, but the disease may be precipitated by any debilitating cause, indiscretion in diet or malaria.

The bacillary variety occurs in almost every part of the world but is more common in the tropics, while the amoebic variety is commonly confined to tropical and sub-tropical countries. Dysentery is more prevalent during the warm damp months of the rainy season. The incubation period of the bacillary variety is from 2 to 7 days; but in the amoebic variety it varies considerably and the disease may take a long time to develop. The period varies between 9 and 90 days.

A mild attack of bacillary dysentery differs but little from an attack of diarrhoea and there may be no mucus or blood in the stools, it may disappear soon or increase in severity within 24 hours. The stools become very frequent and blood and mucus or pus appear with abdominal pain and painful straining, loss of appetite and prostration. Headache, vomiting and drowsiness may be present and the temperature rises 101 or 102. The frequency of stools may rise to 15 or more in 24 hours, they become scanty with hardly any faecal matter in them. The duration of the disease is usually from a few days to 3 or 4 weeks. In the malignant form, which resembles cholera, the onset is sudden with persistent vomiting, great frequency of stools and great prostration. Another very severe variety is known as gangrenous dysentery in which the mucous membrane of the intestine becomes gangrenous and shreds of dead membrane are passed in the stools. Other symptoms are very severe and death may take place within five days. An attack of ordinary severity may become chronic and last for years if it is not treated properly or if any indiscretion in diet is committed.

The onset of amoebic dysentery may be sudden or gradual like the bacillary variety and it behaves very much like it. If no treatment is taken the attack gradually subsides but the symptoms reappear after a few days at irregular intervals. Such patients have chronic looseness of bowels, they become emaciated and anaemic and might get amoebic abscess of the liver or some other complication and ultimately die.

Both kinds of infection, viz., bacillary and amoebic, are very often present in the same patient. The diagnosis of these two varieties is made by a careful microscopic examination of the stool.

**TREATMENT.** Absolute rest in bed and avoidance of all solid food are imperative. During the acute stage the diet should be liquid and should consist of whey, barley or rice water sweetened with glucose, sago or arrowroot boiled in water, or albumen water. These should be given in small quantities at frequent intervals. Milk is not suitable at this stage. When the acute stage has passed peptonised milk, chicken broth and boiled rice might be added and when mucus and blood have disappeared from the stools plain or buttered toast, poached eggs, milk puddings and fruit juice might be given, and return to normal diet should be very gradual. Pain and discomfort in the abdomen can be relieved by frequent hot fomentations, and vomiting by a mustard plaster on the pit of the stomach and sucking a piece of ice. A thorough evacuation of the bowels in the very beginning is advisable; for this purpose an initial dose of  $\frac{1}{2}$  to 1 ounce of castor oil in emulsion (No. 3) or 3 to 6 drachms of magnesium sulphate in 8 ounces of water is given followed by smaller doses every two hours. One to one and a half drachm of castor oil in emulsion or one ounce of a saturated solution of magnesium sulphate is given every two hours for 24 to 36 hours or longer until the character of the stools changes and all blood and mucus stop and faecal matter reappears. The pain and straining also abate and the patient feels comfortable. After this the above treatment is continued three times a day for two days. In mild cases this is enough to effect a cure, but if there is much blood or pus the above treatment is supplemented by the oral administration of powders containing 20 grains or subnitrate of bismuth and 5 to 10 grains of compound ipecacuanha powder (No. 139) thrice daily. Compound ipecacuanha powder contains opium and should not be given to young children. Antidysenteric serum is also useful in bacillary dysentery when injected in the early stages. Some sulpha compounds are now used and have been found to be very efficacious.

The specific treatment for amoebic dysentery is emetine obtained from ipecacuanha root. It is given by intramuscular or subcutaneous injection in  $\frac{1}{2}$  to 1 grain doses once daily until six grains are given. It is a good plan to give emetine in every case of dysentery as soon as the disease appears in case a correct diagnosis cannot be made early as to the nature of the trouble; the purgative treatment described above should be carried out at the same time. For oral administration of emetine tablets containing one grain of emetine with iodide of bismuth are available. Three of these might be given in one single dose at bedtime or one tablet thrice daily. A drug sold under the trade name of Yatren 105 is also used for both kinds of dysentery, specially for the amoebic variety.

With proper medical treatment, diet, rest, etc., the disease can be got rid of within two weeks. In case the disease becomes chronic, which does not often happen if the above treatment is properly carried

out, rectal irrigation will have to be given. One of the following may be used once a day: nitrate of silver 2 to 4 grains dissolved in a pint of distilled water; protargol 20 to 40 grains; albargin 20 grains or permanganate of potassium or calcium 2 to 6 grains per pint of water. The weaker solution should be used to start with and the strength gradually increased, the fluid should be retained from ten to thirty minutes. In case there is much pain and discomfort during defecation starch and opium enema (No. 11) might be used. Some of the sulpha drugs are very useful in cutting short the disease, especially the bacillary variety.

A very cheap and useful remedy used in India for chronic dysentery is bael fruit (*Aegle Marmalos*). A liquid extract of the fruit in 2 drachm doses four times a day or 2 ounces of the syrup in a little water is given. Where the fresh fruit is available a watery decoction of the pulp might be used twice daily. The pulp of one fresh ripe fruit is stirred up in a tumblerful of water and kept for six hours, the liquid is then strained and sweetened and drunk before breakfast and at bedtime. Another cheap and equally effective Indian remedy is the infusion of kurchi bark (*Holarrhena Antidysenterica* or *H. Pubescens*) which is made by infusing 2 ounces of the crushed dry bark in one pint of boiling water for 8 hours. Half to one ounce of the strained liquid is given thrice daily. The dried bark as well as the liquid extract are available in the bazaar.

As the infection of dysentery is present in stools and is spread by the contamination of food and water, the same precautions as described for cholera are necessary for its prevention.

**Enteric Fever.** See Typhoid Fever.

**Erysipelas** or St. Anthony's Fire. It is an acute infective inflammation of the skin accompanied with a severe constitutional disturbance. The infection gains entrance through a wound or a minute abrasion which may not be visible to the naked eye. In pre-antiseptic days when the method and nature of wound infection were not known it was a common disease in surgical wards of a hospital. The incubation period is usually from 1 to 3 days, but may be as long as a week.

The most common site where the trouble starts is the face in the vicinity of the nose, eyes or ears, but it may affect any part of the body. The onset is abrupt with a chill, itching and soreness at the site of infection followed by pain in the limbs and high fever which may reach upto 104 or 105 and in severe cases delirium and prostration. The skin affected is red, hard, swollen and painful on pressure and soon gets covered with small vesicles or blebs. The inflammation spreads rapidly, but usually stops on the forehead, at the chin and the nape of the neck. Ordinarily the disease lasts for 6 to 8 days, but may persist longer or relapse in the same area or some other place. In infants and old or debilitated persons death may take place, but the mortality from the disease has been practically abolished since the introduction of sulpha drugs and penicillin in the treatment of erysipelas.

**TREATMENT.** The patient is kept in bed and given light nourishing

diet and plenty of liquid to drink. Itching can be relieved by the application of lead lotion on a piece of clean lint with an addition of 10 minims of laudanum to an ounce of the lotion [No. 41 (2)], or of a saturated solution of sulphate of magnesium. Headache is relieved by aspirin and caffeine powder (No. 135). The administration of sulpha drugs by the mouth or penicillin subcutaneously cuts short the disease.

**Glanders** or Farcy. It is a highly infectious disease of the horse, cattle, sheep, pigs and goats and is caused by a specific microbe transmitted to man through direct contact or in milk or butter obtained from diseased animals. It is found in persons who come in contact with animals, such as grooms, shepherds, cowherds, milkmaids, etc. Its incubation period in man is from 2 to 15 days, but is much shorter in the horse and cattle.

It is usually ushered in by fever, headache, vomiting, nausea and pain in different parts of the body. These symptoms are soon followed by abscesses and nodular swellings along the length of the arm and forearm which are called farcy buds. These break down and suppurate and form ulcers. Similar nodules and ulcers form in the mouth and nose and discharge profuse thick pus which is very infective. The joints become inflamed and painful. Pneumonia may develop during the course of the disease or may be present from the beginning. This causes cough, pain in the chest and difficulty of breathing and may end in death. In the chronic variety the symptoms develop gradually and the ulcers may heal but break out again. The acute variety is a dangerous disease and invariably ends in death.

**TREATMENT.** This is carried out on general lines there being no specific remedy for it. Fever, headache and pain in the joints may be relieved by aspirin and caffeine powder (No. 135). The patient's strength should be kept up by rest and nourishing diet.

Every animal that suffers from glanders is a danger to its attendant and other animals; it should therefore be destroyed immediately and the carcass buried deep where it is not likely to be dug up by jackals. The attendants on a patient should clean and disinfect their hands thoroughly and protect themselves from the discharge from the mouth and nose. All discarded surgical dressings should be burnt.

**Glandular Fever.** It is a mild acute infectious disease which chiefly attacks children and young adults. Its incubation period is from 3 to 10 days. The onset is often gradual, but may be sudden. The temperature rises to 100 to 103 and is accompanied with headache, sore throat, cough, pain in the abdomen and sweating. The lymphatic glands in the neck are enlarged and painful, the tonsils may also be enlarged as also the spleen. The fever is irregular in type and continues for 2 weeks or so and subsides with other symptoms. Practically all cases recover.

**TREATMENT.** There is no special treatment for this disease and the symptoms are treated on general lines. The child suffering from it should be isolated from healthy children until he recovers completely.

**Infectious Jaundice** or Weil's Disease. It is an infectious variety of

jaundice found in an epidemic form affecting males more often than females, usually among soldiers living in barracks, and miners. The microbe is found in rats all over the world and is excreted in their urine and faeces. It is not known how it enters the human body.

The onset is sudden with chills soon followed by fever, nausea, vomiting and pain in the muscles of the legs. There may be some bleeding from the nose and gums or under the conjunctiva. Within 3 to 6 days jaundice sets in and the liver becomes enlarged and painful on pressure. The stools become lighter in colour and the urine becomes dark greenish yellow on account of the presence of bile in it. Inflammation of the kidneys of a mild or severe type might set in during the course of the disease. The symptoms last for ten days or so and subside gradually.

**TREATMENT.** There is no specific treatment for this disease. The patient is kept in bed on light nourishing diet and plenty of liquids. The symptoms are treated on general lines.

**Influenza.** It is an acute highly infectious disease which appears at irregular intervals in an epidemic form and spreads with extraordinary rapidity from one country to another sweeping the whole world. The infection spreads from person to person and a very large proportion of the population is attacked within a very short space of time. Influenza by itself is of short duration and is not a serious disease, but on account of its extensive prevalence and dangerous complications affecting the respiratory organs and the heart it leads to serious and fatal consequences. It is caused by an unidentified virus. The incubation period is very short being one to three days.

The onset is sudden with chills, fever and catarrh of the nose, throat and windpipe. There is great prostration with pain in the limbs, back and behind the eyeballs and headache. The temperature may go up to 105, the face is flushed, the conjunctivae red and the patient is listless. Dry irritating cough is present with burning and soreness behind the breast bone. In simple uncomplicated cases the temperature comes down to normal and the symptoms begin to subside after 3 to 5 days. In most cases the convalescence is rapid though some soreness in the chest and cough continue for many days. Bronchitis is a common complication which prolongs the disease for some days or weeks. It sets in after the third day. The temperature does not come down but becomes irregular and varies between 100 and 102. The cough becomes more frequent and troublesome and an abundant quantity of purulent sputum is brought up.

Pneumonia is a dangerous and very often a fatal complication of influenza. It might be present from the very beginning when it is rapidly fatal, or it might appear on the third or the fourth day, or as happens in some cases it comes on after apparent recovery. In cases that recover the temperature slowly returns to normal and the symptoms disappear gradually and the patient remains weak and prostrated for some time. The heart muscle is weakened by the toxic condition and the patient even after recovery is unable to undergo much physical exertion. Death may take place at any time from sudden failure of

the heart.

Influenza may affect the stomach and intestines when it is known as the gastro-intestinal variety in which the symptoms are located in the abdomen, viz., pain in the stomach, vomiting and diarrhoea and sometimes jaundice with or without respiratory symptoms. Common cold or coryza which behaves like a mild attack of influenza is popularly called influenza but it is a different disease.

**TREATMENT.** The patient should remain in bed until the temperature has been normal for at least 3 days and all acute symptoms have subsided. Light diet and plenty of fluids should be taken. There is no specific drug and the symptoms are treated on general lines. Fever and headache are relieved by aspirin and caffeine powder (No. 135), for sleeplessness and restlessness 5 grains of aspirin and 8 grains of Dover's powder might be taken at bedtime and a saline purgative for the relief of constipation. For persistent vomiting food should be withheld for 12 to 24 hours and only very small quantities of iced liquids should be given. Frequent gargles with a weak solution of permanganate of potassium, equal quantities of glycerin and water or a solution of common salt in water may be used to allay the irritation of the throat. For nasal irritation tincture of perchloride of iron and glycerin in water (No. 31) may be applied 3 or 4 times a day. The treatment of bronchitis and pneumonia is described under these heads.

There is no prophylactic inoculation for the prevention of influenza. During an epidemic crowded places, such as theatres, cinemas and lecture rooms should be avoided as also contact with cases of influenza.

**Kala Azar.** Dumdum Fever, Leishmaniasis or Black Fever. It is a chronic infectious disease caused by a minute unicellular animalcule called Leishman Donovan Body from the two scientists who first discovered and described it. It is prevalent in the north-east parts of India, Madras, Dutch East Indies, North China, all countries of the Mediterranean littoral and southern Russia. It is not found at an altitude of over 2000 feet above the sea level. The micro-organism is believed to exist in the body of some insect and is transmitted to human beings by its bite, but so far no definite information is available. Nothing is known about the incubation period of the disease.

The onset is insidious and few patients can remember a definite beginning of the symptoms except irregular attacks of fever and gradually increasing weakness. The temperature rises to 103 or higher and shows a rise and fall during 24 hours. The fever continues from 2 to 6 weeks then subsides for a few days but recurs again. The patient loses strength, becomes emaciated and anaemic and has a tendency to bleed from the nose and gums. The skin assumes a dark earthy colour which is very characteristic of the disease. The spleen is hard, enlarged and painful to the touch. If the patient does not receive proper treatment he succumbs to the disease or some other intercurrent malady, such as dysentery, pneumonia, etc.

**TREATMENT.** The specific treatment consists in administering salts of antimony intravenously. A 2% solution of sodium antimony tartrate in freshly prepared double-distilled water is used for the purpose. About

10 minims of this solution diluted with 10 c.c. of the same distilled water are administered twice a week and the dose gradually increased to 30 minims. Organic compounds of antimony are also available; these are non-irritating and less toxic and are now being used.

**Leprosy.** It is a chronic infectious disease caused by a specific bacillus. Clinically it is found in three different varieties which are known as (a) anaesthetic, in which loss of sensation is the most prominent symptom, (b) nodular, in which small nodules grow on the skin in different parts of the body, and (c) mixed, in which both these features are present. The disease is mildly contagious requiring prolonged and intimate association with a patient for its transmission. It is prevalent in all Asiatic and African countries, Northern Europe, Iceland, parts of America, Philippines and Balkan countries. It was very prevalent in Europe at one time, but strict isolation of the patients and general sanitary measures have abolished it from most of the countries. The period of incubation is long and may be from a couple of months to several years.

The onset is very slow and the early symptoms very indefinite and not at all characteristic. It might start with attacks of fever, pain in muscles and joints, neuralgia or a chronic inflammation of the nasal mucous membrane. These early symptoms are often mild and do not attract the attention of the patient and the first symptom, which is noticed accidentally, is anaesthesia, i.e., loss of sensation in the skin. In the anaesthetic variety the loss of sensation is the more prominent symptom. Dark smooth patches of various sizes appear on the skin of the extremities, back and abdomen; in white people these are pinkish in colour. In the beginning these areas are hypersensitive but soon lose all sensation of touch, pain and temperature. The patient may be quite unaware of the presence of these patches and may discover the loss of sensation when the part is accidentally injured or burnt. In such cases unsightly sores, which do not heal readily, are produced. The muscles of the hands and feet are wasted and the small bones of the fingers and toes get absorbed and perforating ulcers form on the soles of the feet which destroy the whole thickness of the issues. The patient becomes weak and exhausted and lingers in this state until he dies either from exhaustion or some intercurrent disease.

In the nodular variety the skin is mainly affected and there are small tumours on the face, back of the hands and other parts of the body. The skin of the face and ears is thickened and red, the hair of the eyebrows falls and the face presents a peculiar appearance which is known as "leonine". The nodules may be enlarged and remain hard or they might become soft and ulcerate and produce unsightly sores. The patient may linger in this condition for years or may die at any time from tuberculosis, pneumonia or some other disease. In the mixed variety the symptoms of both the types are present, though in majority of cases the predominant features are those of the nodular variety.

Until a few years ago the prospects of a leprous patient were very gloomy. In some cases temporary arrest or regression of symptoms takes place, but all untreated or advanced cases linger for years before they die. With proper nursing, food and the early administration of the

specific treatment the disease can be arrested and the patient rendered non-infective.

**TREATMENT.** Crude chaulmugra oil has been used as a remedy for leprosy in India from time immemorial. It is given orally in 5 minim doses thrice daily and gradually increased to 30 or 40 minims. It has a disagreeable odour and causes nausea, vomiting and diarrhoea and patients refuse to take it for long; it is therefore given intramuscularly in 10 minim doses mixed with camphor, iodine and olive oil once a week. A very convenient preparation for injection has been made from the oil which is known as ethyl ester of chaulmugra oil; it is non-irritating and quite efficacious. Some sulpha preparations have been used with much success; these are available under different trade names, one of them called "diasone" has given very encouraging results and is likely to supersede all other remedies. Streptomycin, which is prepared from a fungus in the same way as penicillin and which has given encouraging results in the treatment of tuberculosis, is likely to be useful in leprosy. But to be of any use the treatment has to be commenced very early and before much permanent damage is done to the tissues. Cod liver or halibut oil, iron and arsenic are also administered to keep up the strength.

Leprosy is disseminated by coughing, sneezing, spitting and by the discharge from the sores and also by the nasal secretion of the patient. The disease could be completely wiped out as has been done in many European countries and America by compulsory isolation and other sanitary measures. In India the public as well as State authorities seem to be quite apathetic to this serious danger to public health and although in many places facilities for isolation and treatment of lepers exist no serious steps are taken to bring the disease under control. It is a fairly common sight in every large city in India to see a large number of lepers in all stages of deformity and with open discharging sores begging in crowded streets and spreading infection without any let or hindrance. How deep-rooted is this apathy could be imagined from the fact that in a large city a number of houseless lepers have been camping on the open space in front of the vegetable and meat market and in the compound of an adjoining school where children are often seen playing.

Personal preventive measures consist in avoiding contact or close association with patients who are in an infective state. It is advisable to have all newly appointed servants examined by a medical man as the disease can be transmitted even in the early stages.

**Lethargic Encephalitis** or Epidemic Encephalitis. It is an acute infectious disease affecting the brain and caused by some virus; the nature and mode of its transmission are not known. The disease breaks out in an epidemic form and was first described by a Viennese doctor in 1917; since then epidemics have been noticed in other countries; fortunately so far no epidemic has been observed in India. There is no information available as to its incubation period.

The onset varies and may be sudden or gradual, there may be some respiratory symptoms soon followed by moderate fever, headache, pain all over the body, mental confusion and lassitude. The most constant

symptoms are profound lethargy, weakness or paralysis of the muscles of the eyeball, twitching and tremors in the arms and headache. In another type of the disease there is rigidity of the muscles which interferes with the voluntary movements and renders the patient helpless. In another variety the symptoms of mental disturbance are prominent. Epidemic hiccough, which at times breaks out in places where the disease has been present, is believed to be due to a mild infection by its virus. Most of the patients that get over the disease recover their normal health in a few days' time, others remain invalids for a long time, while a few develop some chronic disease of the nervous system or mental derangement.

**TREATMENT.** There is no specific remedy for the disease and the symptoms are treated on general lines. The patient is isolated in a quiet, dark, well ventilated room and given light nourishing diet and plenty of fluids to drink. Mild saline purgative, diaphoretics, etc., are given and icebag applied to the head.

**Malaria.** Ague. Malaria is a communicable disease caused by a minute microscopic animalcule which is transmitted from man to man through the bite of an anophelene mosquito. The disease is characterised by paroxysms of fever preceded by shivering and rigor and followed by profuse sweating. The paroxysms may occur daily when it is called quotidian, or every other day when it is called tertian or every third day when it is called quartan. A pernicious and rapidly fatal type of the disease is known as malignant malaria. In the chronic form of malaria there are periodic attacks of fever of an irregular type with enlarged spleen, anaemia and general ill health. The parasites, as soon as they are introduced into the blood, attack and destroy the red blood corpuscles. Malaria is prevalent in all Asiatic countries, Africa, Southern Europe and America. Lavran, a French army surgeon, discovered the parasite in the human blood in 1880, and Ross in India demonstrated that it continued one phase of its existence in the body of the mosquito. The incubation period is short and depends on the severity of the infection. As determined experimentally it is found to vary between 3 and 15 days.

The paroxysm of an acute attack consists of three stages, viz., the cold or the shivering stage, hot or the stage of fever, and the sweating stage. The onset is sudden and may be preceded by yawning, lassitude, aching of the limbs, headache and sometimes vomiting. The patient feels cold, begins to shiver and has severe rigors which shake the bed. This lasts for a few minutes to an hour or so. Although the patient shivers and the surface of the skin is cold the temperature in the mouth may be as high as 105. Fever soon follows with dry hot skin, flushed face, headache and thirst; there may be delirium. The temperature which reaches 104 or 105 continues from three to five hours after which the patient breaks out into profuse perspiration which saturates his clothes and bedding. The temperature comes down, headache subsides and other distressing symptoms disappear and the patient feels comfortable. The sweating stage lasts from 1 to 3 hours and when it is over the patient is able to go about his business as usual until the

next paroxysm. In some cases, particularly in chronic ones, these three stages are not so distinct and the fever is prolonged. In young children the first stage is ushered in by a convulsive seizure.

The paroxysm comes on when the parasites in the blood attain maturity and divide themselves in the process of multiplying. There are three different kinds of parasites and each has a different period of development, the interval between the paroxysms, therefore, varies according to the kind of parasite present. The quotidian variety takes 24 hours while the tertian and quartan take 48 and 72 hours respectively. If there is a double infection the paroxysms come on at irregular intervals or twice during 24 hours. In the malignant or pernicious type the parasites are in such large numbers that they block the small capillaries in the brain and produce delirium, unconsciousness and coma. The cold stage is very short or absent and the fever is irregular and very high reaching 107 and in some cases 110 and the patient may die without regaining consciousness. The state of coma lasts from 12 to 24 hours, after which the patient regains consciousness but again passes into the same condition after a short interval unless he receives proper treatment. This kind of malaria, though very virulent, is amenable to specific treatment. Some patients with malignant malaria have gastrointestinal symptoms with obstinate vomiting, diarrhoea or a severe form of dysentery.

Cases, which are neglected and become chronic, suffer from general ill-health with anaemia and great weakness, which is known as malarial cachexia. They get frequent and irregular attacks of fever and are mentally and physically incapacitated from any serious work. The spleen is very much enlarged and can be easily felt, it is hard and brittle and ruptures on least violence causing fatal internal bleeding. If a patient remains in an endemic locality he may be reinfected after a thorough cure unless he takes precautions to protect himself. In many chronic cases the parasites become immune to quinine, especially if the drug has been taken in inadequate doses. All mild cases recover completely under proper treatment and have no ill effects; even neglected cases do not always end in death and many patients suffering from it are able to go about their work.

**TREATMENT.** During the cold stage the patient is kept in bed well covered and given hot drinks. During the hot stage icc-bag on the head and sponging the body will give him relief. During fever he might become delirious and do himself harm; he should, therefore, not be left alone. Diaphoretics are not necessary as profuse perspiration is bound to follow in the natural course of the disease. For headache or high fever one aspirin and caffeine powder (No. 135) might be given. During the sweating stage his clothes and bed linen should be changed and he should not be exposed to draughts.

Until a few years ago quinine was the only specific remedy for malaria and even now it is unrivalled in its effect and potency against the disease. At present some synthetic drugs have been produced and are sold under different trade names, such as atebrin (mepacrin), plasmo-chin, paludrine, etc., which are very effective against malaria. But the

successful treatment of malaria depends on the administration of the remedies in proper doses and for a sufficiently long period of time so as to destroy all the parasites, not only in the blood, but also in the spleen and the bone marrow where they are not easily reached by the drugs and where they remain alive and bring about frequent relapses. To begin with 30 grains of quinine daily, divided into three doses of 10 grains each, are given for 3 or 4 days. This will get rid of the parasites in the blood. To destroy those in the spleen and the marrow, after this initial treatment, 10 grains are given once daily for six to eight weeks. For children the dose should be proportionately smaller as also for debilitated persons. For children  $1/20$ th of the adult dose for each year of age is sufficient; a child 2 years old should receive 1 grain thrice daily and after the age of 15 the full dose may be given.

Quinine can be administered in different forms, viz., mixture, pills, powders and injections. Taken in the form of mixture it is readily absorbed but it is very bitter; its taste can be disguised to some extent by syrup of orange or lemon, or glycerin. The mixture is made up with dilute hydrochloric or sulphuric acid (No. 83). Quinine acts better and does not produce some of the unpleasant symptoms if an alkali salt, such as bicarbonate of sodium is administered about 15 minutes before it. Pills and tablets are very convenient to take and are available in different doses. Those manufactured by reliable chemists should be used as many adulterated preparations are sold in the market and some do not contain any quinine at all. Quinine is very bitter and is unsuitable for children. Injections are generally given in malignant malaria when its immediate effect is required; they are given intramuscularly or intravenously. There are some tasteless preparations of quinine but they are not so potent as the ordinary salts.

Some persons are hypersensitive to quinine and get very unpleasant symptoms even after a small dose, such as dizziness, nausea, palpitation, puffiness of the eye-lids, deafness and eruptions. Some of these symptoms are produced by an overdose. Quinine is apt to have deleterious effect on pregnant women to whom it should be given only if necessary and under medical advice.

Atebrin is available in tablet form each containing  $1\frac{1}{2}$  grains which is to be taken three times a day after food, the daily total dose being  $4\frac{1}{2}$  grains. This is to be continued for five to seven days. For intensive treatment for the first two days five tablets are taken, viz., two in the morning, one in the afternoon and two in the evening, after that three tablets daily for four days. It destroys almost all varieties of the parasite. Atebrin may be taken alone by persons who are unable to take quinine, or as it is now commonly used to supplement the treatment with quinine which is administered for the first two days. Atebrin very rarely produces any unpleasant symptoms, but there is a yellow discoloration of the skin which disappears soon after the drug is discontinued. Plasmochin is given in  $1/3$  grain doses 3 times a day for five days in some forms of malaria. It sometimes causes toxic symptoms, such as pain in the abdomen, nausea, blood in the urine, etc. On the slightest occurrence of these symptoms it should be stopped.

This drug should be used under medical advice and supervision.

Paludrine is useful in all types of malaria and rarely produces any unpleasant symptoms. One tablet of .3 gram is to be taken once a day for ten days; this gets rid of all the parasites in the body including the malignant type. To prevent a recurrence one tablet of .3 gram should be taken once a week for 3 to 6 months according to the severity of the attack.

Chronic malaria with accompanying anaemia, debility and enlarged spleen, not only requires a prolonged course of quinine, but also tonics, such as iron, arsenic, etc. A combination of quinine and arsenic (No. 84) is very useful. A change to a hill station is advisable.

For the transmission of malaria two things are necessary, viz., a person who has the parasites in his blood and the anophelene mosquito to convey them to a healthy person, the preventive measures, therefore, can be divided into personal and general. The former consist in protecting oneself against the bite of the mosquito and the latter include the destruction of the mosquito and its larvae and treating all malaria infected persons so as to get rid of the parasites. In all malaria infested localities one should always sleep under a mosquito-curtain which should not have a slit but should be complete all round, as even a small gap is sufficient to admit the mosquito. It should be lowered and securely tacked under the mattress in daylight after making sure that there is no mosquito inside. A patient who has malaria should always sleep under a curtain. In highly infected localities and during malaria season the bedrooms should be fumigated with some strong smelling incense or sprayed with an insect repelling fluid so many of which are available in the market. Villagers in India fumigate their huts at night by burning neem leaves (*Melia azadirachta*), these cost nothing and are quite effective. The anophelene mosquito is rarely active before 9 p.m., it is therefore advisable for persons living in infested localities to avoid wearing shorts and shirts with short sleeves after sunset and use anti-mosquito cream on the exposed parts of the body. Such creams are available from chemists or can be easily prepared at home. The following is a good anti-mosquito cream:

Oil of citronella	..	..	..	18 parts
Oil of cinnamon	..	..	..	2 parts
Cedarwood oil	..	..	..	9 parts
Camphor	..	..	..	1 part
Hard Paraffin	..	..	..	25 parts
White vaseline	..	..	..	45 parts

Melt the hard paraffin on fire and add the vaseline and other ingredients and mix well. The liquid should be cooled rapidly so as to prevent the ingredients getting separated. A cheap and easily available repellent is the juice of sour lime; a freshly cut slice should be rubbed on the exposed parts and the juice allowed to dry. Quinine in moderate dose taken as a preventive against malaria is of doubtful value.

The general measures against malaria include the destruction of the

adult mosquito and its larvae and doing away with the breeding places. It is for the Municipal and Public Health Authorities to undertake these measures, yet a good deal can be done by the public to assist and co-operate with them in this work. The female mosquito lays its eggs on the surface of standing water, any small or large collection of water is used for the purpose and in the rainy season such collections are found in abundance. Larvae have been found in water collected in small tins and earthen pots carelessly thrown about in the garden, in hoof marks of cattle, garden tanks, fountains and hollows in tree trunks. Larvae hatch out and live in water for some days before they develop into full-fledged mosquitoes when they come to the surface and fly away. (See Mosquito, page 163, Vol. I). D.D.T. sprays have been successfully used for large scale destruction of adult mosquito in rural areas.

**Malta Fever.** Mediterranean Fever or Undulant Fever. It is caused by a micro-organism which is transmitted to human beings through drinking goat's milk; the goat harbouring the infection does not show any signs of the disease. It is called Malta Fever as it was first recognised and described in Malta, though it is not confined to the island, being prevalent in all countries around the Mediterranean Sea, parts of India, Africa, Arabia, China and the West Indies. The incubation period is from six to twenty days.

The onset is gradual with fever, lassitude, headache, pain in the back and limbs, and loss of appetite. In the commencement these are not so severe as to prevent the patient from attending to his work but they soon become aggravated and bring on a state of exhaustion. The fever rises in the afternoon and comes down a little at night with sweating. The symptoms abate after a week to 12 days but the patient remains dull and listless. A few days later the symptoms return and the relapse may continue as long as the first attack or longer. Such relapses may come on for months before the patient finally gets over the disease. The mild variety lasts for about four weeks, but the average duration is three months, the longest being over a year. The impending improvement is often indicated by milder relapses and longer intervals between them. The prospects of recovery are good with proper treatment and nursing. High fever and short intervals between attacks are bad signs.

**TREATMENT.** The treatment is carried out on general lines for the relief of symptoms as there is no specific remedy for the disease. Complete rest in bed, light nourishing diet and proper nursing are indicated. Mild saline purgatives for constipation, icebag on the head, cold sponging and diaphoretics for fever, and aspirin and caffeine powder (No. 135) for persistent headache, and an occasional tablet of trional for sleeplessness might be given. In the endemic area goat's milk should be avoided or if it is to be used it should be well boiled.

**Measles** or Rubcola. It is an acute infectious disease, mostly of children and young persons, though not altogether absent in older people. It frequently breaks out in an epidemic form, mostly during colder months of the year. It is more easily communicated to healthy

children than any of the other infectious diseases. It is prevalent in all countries and affects all races. Its incubation period is from 8 to 12 days, rarely longer than 15 days.

The course of the disease can be divided into three stages, viz., invasion, period of eruption and convalescence. The period of invasion usually lasts from 3 to 4 days but may be as long as seven days. During this stage fever, catarrhal inflammation of the mucous membrane of the eyes, nose, mouth and the respiratory tract, preliminary rashes and the rise of temperature to 102 or 103 are present. These early symptoms are often so mild that the true nature of the disease is not recognised until the specific eruption appears. The preliminary eruption is found in the mouth in the form of small spots, pin-head in size and bluish-white in colour. During this stage a short-lived eruption, in the form of small isolated papules or dark-red spots, may appear on the skin which disappears after 36 hours.

The eruptive stage usually commences from the fourth day when the specific eruption of measles appears, at first on the neck behind the ears from where it spreads to the face, chest, back, abdomen and the limbs. The entire body may be covered within 3 days. In the beginning it consists of small dusky red spots which soon increases in size and number and form large patches. All the general symptoms get aggravated, there is much itching of the skin, burning of the eyes, discharge from the nose, and fever. It takes about 48 hours for the rash to develop fully and when it is at its height the temperature comes down and there is a general improvement in all the symptoms, except the cough which continues for some days longer. As soon as the rash subsides small flakes from the superficial layer of the skin are shed. Respiratory complications may occur, especially in debilitated children, and may become very serious. Occasionally, a very severe and fatal form of the disease is met with in which there is marked prostration, high fever and bleeding from the nose, gums, lungs, bowels and under the skin. It is known as *black* or *haemorrhagic* measles.

**TREATMENT.** There is no specific treatment for measles and in a large majority of cases, especially in older children none is needed apart from diet, nursing and measures to prevent complications. The patient is isolated and kept in a warm well ventilated room and protected from draughts and strong light. The mouth, nose and throat should be cleaned frequently with boracic glycerin and the eyes washed with boric lotion. Cough and discomfort in the chest can be relieved by rubbing a little camphorated oil or the administration of a cough mixture (No. 98). In India the child is kept on vegetable diet and is given no medicine, but is given plenty of water sweetened with *gur*, i.e., molasses which is soothing to the air passages and is nourishing. The patient should remain in bed for a few days after the temperature is normal and should be put on cod liver oil and tonics.

**Mumps.** It is an acute infectious disease characterised by inflammation and swelling of one or both parotid glands with mild general symptoms lasting about 7 days in uncomplicated cases. The nature of the infection is not known but it is present in the saliva of the

patient and is transmitted to healthy persons in the droplets produced while sneezing, coughing or speaking. The virus does not remain active for long outside the body. The disease is found in all countries of the world. It is rare in infants and persons above 40, and is very common in adults between 18 and 30. As a rule one attack gives immunity for life. The incubation period is from 8 to 30 days, usually it is about a fortnight.

The symptom that is usually noticed is the swelling of one or both the parotid glands in front and below the ears. The swelling is hard and painful on pressure and increases in size for three days and subsides after a week or 10 days. A common complication of mumps is orchitis, i.e., inflammation of the testis, one or both the organs may be involved with high fever and prostration. Mumps is a mild disease and practically all cases recover. In adults the orchitis may cause wasting of the organ.

There is no specific treatment for mumps. If the swelling is very painful hot fomentations may be applied or the part painted with glycerin of belladonna. It is also painted on the inflamed testis which is supported with a suspensory bandage. The patient is kept isolated for two weeks after the swelling of the parotid subsides.

**Oriental Sore.** Bagdad or Delhi Boil. It is a chronic ulcerating sore occurring mostly on the exposed parts of the body, such as face and limbs. It is caused by a minute microscopic animalcule conveyed to human beings by the sandfly (phlebotomus). It is prevalent in almost all the eastern countries, Egypt and other parts of Africa and Southern Europe. The incubation period may be anything from a fortnight to five or six months. It commences as a small papule which tends to become enlarged and soon ulcerates. A small crust or scab forms on the surface but there are no signs of healing underneath. The skin round the sore is hard and thickened. The ulcer spreads, not only beyond the margin but deep into the tissues. It continues in this condition for months showing a feeble attempt at healing in one part while it spreads in some other part. A very unsightly deformity results from the contraction of the extensive scar. There is no risk to life, but septic infection of the sore might cause serious trouble.

**TREATMENT.** The specific remedy which cuts short the disease and brings about a rapid cure consists in administering intravenously some soluble preparation of antimony, the usual one being sodium antimony tartrate (tartar emetic). To start with  $\frac{1}{4}$  grain of this is dissolved in 10 c.c. of distilled water and injected slowly into a vein twice a week. The dose of the drug is gradually increased to  $\frac{3}{4}$  of a grain. The sore soon clears up and shows signs of healing and if the treatment is undertaken at an early stage there is no scar or disfigurement left. Carbon dioxide snow (dry ice) and X-rays have been used with success. Prevention consists in protecting oneself in endemic area against the bite of sandflies.

**Paratyphoid Fevers.** Three types of this fever are known, viz., paratyphoid A, B and C, which are milder and of a shorter duration than typhoid fever, producing similar symptoms and require the same treat-

ment as typhoid (see page 76).

**Plague or Bubonic Plague.** It is an acute infectious disease, originally of the rat, transmissible to man and caused by a microbe which is conveyed from rat to rat or rat to man by the rat flea. Human flea is also known to convey the disease but this is not usual. The microbes, which circulate in the blood of the infected rat, are taken up by the flea, in whose stomach they multiply. When the rat dies the flea leaves it for a healthy rat or infests the human being, in whose system it introduces the microbes through its bite. The first indication of the impending epidemic in human beings in a locality, is the appearance of dead rats in and around the houses and the disease breaks out after an interval of from 7 to 20 days. Under ordinary conditions the disease is not transmitted from man to man by direct contact, except in the pneumonic variety which is very infectious and invariably fatal. The disease is spread to healthy localities by the migration of plague-infected rats from an epidemic area. The incubation period varies between 3 and 8 days and in pneumonic variety it is 48 hours.

The disease is met with in three forms, bubonic when the infection is primarily confined to the lymphatic glands, septicaemic when it starts in the circulation, and pneumonic when it affects the lungs. The onset is sudden and it is ushered in by high fever, headache, lassitude, drowsiness and a staggering gait. The patient has a very characteristic appearance with an expression of fear, bloodshot eyes, haggard features and dull mental condition. The temperature rises to 105 or 106, the pulse and respirations are accelerated, the tongue is dry and the prostration is so great that the patient is unable to utter audible sounds. Delirium of a low muttering or violent type is present. The characteristic bubo appears usually on the first day but may be delayed till the fourth. It is most commonly found in the groin, less commonly in the armpit and in children it may be in the neck. It is hard and painful on pressure. In favourable cases the temperature begins to come down on or after the fifth day, the bubo becomes less painful and the mental condition improves. The bubo might subside or suppurate and take a long time to heal. In fatal cases the general condition gets steadily worse and the patient passes into a state of coma before death.

The pneumonic variety is a highly infectious and very dangerous form of the disease and is conveyed from man to man by fine droplets coughed out by the patient suffering from this type of the disease. It commences like an ordinary case of pneumonia and as there is no bubo present the nature of the disease is not suspected until it attacks the sick attendants and others who associate with the patient. In septicaemic plague, which is also a virulent form of the disease, the direct invasion of the blood stream by the bacilli produces very severe symptoms ending in death within 36 to 72 hours.

**TREATMENT.** The death rate is very high in untreated cases being over 80%. Pneumonic and septicaemic cases all die. It is very advisable, in the interest of the patient, to transfer him to hospital as

soon as possible where he can be properly looked after and given the latest treatment. Curative serum administered at an early stage has been found to reduce the mortality rate. Recently some of the sulpha drugs have been used with success; it is quite possible some new combination will soon be discovered which would be a specific for plague. Streptomycin, obtained from a fungus, has been tried and found to be effective. The general and symptomatic treatment is carried out as for other severe infectious diseases.

Preventive measures against plague are general and personal; the former consist in improving the general sanitary condition, rat destruction and constructing rat-proof houses and godowns. In Bombay city, where plague made its first appearance in 1896 and where it used to take a heavy toll of human life every year, there has been no indigenous plague for years, thanks to the wholesale improvement in the sanitary condition of the city and systematic rat destruction. Most of the local bodies in India are very apathetic and have not adopted any persistent or permanent measures to prevent the outbreak of the disease. A few untrained labourers are employed, when an epidemic threatens or actually breaks out, to destroy rats, and inoculation centres are opened, and the whole campaign is conducted in a haphazard and desultory manner. Individual preventive measures consist in avoiding visits to infected localities or houses and immediately vacating the house where dead rats are found. The house should not be reoccupied for at least three weeks and before it is thoroughly cleaned and liberally sprayed with D.D.T. or a strong insecticide. Dead rats should be burnt, if possible, on the spot. Anti-plague inoculation if done before infection takes place, is an effective method of protection against the disease. Patients suffering from pneumonic plague should not be visited, but if this could not be avoided, an efficient face mask should be worn so as not to breathe highly infected air unfiltered.

**Pneumonia** (Lobar Pneumonia). It is an acute infectious disease caused by a specific microbe called pneumococcus which produces inflammation of one or more lobes of the lungs, severe constitutional disturbance and great prostration. It is prevalent in all countries and all climates, but is more common in early spring and autumn when the variation in the maximum and minimum atmospheric temperatures is great. Badly nourished persons living in insanitary dwellings are very susceptible to it. Exposure to cold after fatigue or excessive indulgence in alcohol, sudden chilling of the body after exertion and sweating usually bring on an attack. Some individuals are very susceptible to the disease and get it frequently, young ill nourished children and infants are also susceptible to it. The incubation period of pneumonia is very short being a few hours to three days.

The onset is sudden, the patient, apparently in good health or after a day or two of ordinary cold, is seized with chilliness or rigor which is often the first symptom to appear. About the same time there is pain in the chest in front or behind or sometimes in front of the abdomen, and the temperature quickly rises to 104 or 105. In very old patients it does not rise high or may remain normal, the height of

temperature being no indication of the seriousness of the disease. Other prominent symptoms are paroxysms of hacking and troublesome cough, expectoration of thin sticky rust coloured sputum, difficulty of breathing, hurried respiration and pulse. Great prostration and delirium are also present, the patient may run away and do himself harm. In chronic alcoholic subjects delirium tremens might set in which makes the prognosis very grave.

All these symptoms persist for 5 to 8 days unless the disease is cut short by the specific treatment. In cases terminating favourably the crisis takes place suddenly, the patient, who has been desperately ill and on the verge of collapse, perspires freely, the temperature drops to normal or subnormal within a short time, the breathing becomes easy, the patient looks and feels better, asks for food or drink and drops off to quiet refreshing sleep. In cases that terminate fatally the temperature remains high, breathing becomes more difficult and a low muttering or violent type of delirium sets in which ends in death, or death may take place from sudden heart failure. In a small proportion of cases a relapse takes place a few days after the crisis and all the symptoms recur varying in severity. There are many complications of pneumonia of which pleurisy, pericarditis, i.e., the inflammation of the membrane of the heart, or inflammation of the joints, are common. A typical case of pneumonia can be made out without any difficulty and even without any examination of the chest from the difficult and hurried breathing, rust coloured sputum, the appearance of the patient and the mode of onset of the disease.

**TREATMENT.** The patient should be put to bed at once in a well ventilated room. He should be well covered and protected from further exposure and should use bedpan and urinal without getting out of bed. The diet should be liquid or semi-solid and should be given frequently in small quantities at a time. Before the introduction of the sulpha drugs and penicillin the treatment was directed towards the relief of symptoms until the critical period was tided over, but since the discovery of these drugs an attack can be cut short. In case the breathing is very troublesome and the face livid, administration of oxygen is necessary. Small quantities of brandy according to the age and habits of the patient, may be given with a little warm water at frequent intervals. High fever is treated with icebag on the head and sponging the body as described under fever. Brandy or other stimulants may be required during the crisis if the temperature falls suddenly and produces collapse. In India among certain classes pneumonia in infants and young children is treated by frequent oral administration of old mouldy *gur* or molasses. The writer has seen several bad cases of pneumonia in infants do well under the treatment. It is likely the fungus produces penicillin or some other substance of a similar nature which has a specific action on pneumococcus. This remedy does not benefit adults as the substance is destroyed by the hydrochloric acid present in the stomach of grown up persons which is absent or very weak in infants. Unfortunately no research has been made on the subject otherwise India might have got the credit for

the discovery of this wonder drug.

The infection is disseminated in the breath while coughing, etc., or in children by kissing; precautions are, therefore, necessary to avoid these, as also exposure to cold draught after severe exertion or a drinking bout or with wet clothes.

**Acute Anterior Poliomyelitis** (Poliomyelitis) or Infantile Paralysis. It is an acute infectious disease, mostly attacking children between the ages of 2 and 5 years, though other ages and adults are not quite exempt. Boys are more frequently attacked than girls and the disease is much more common in well fed children of better classes. It is due to ultra-microscopic virus, the exact nature of it and the actual method of its spread are not definitely known. But the available evidence shows that it is transmitted through the breath of infected persons and carriers, it is also conveyed through food and drink. Flies are also capable of carrying the infection and the virus has been found on them during an epidemic. The incubation period is from 4 to 12 days.

The onset is sudden with fever, headache and pain and soreness of muscles, or the attack may commence with the symptoms of coryza. The child is restless and irritable or may be drowsy and restless alternately. These initial or pre-paralytic symptoms abate after a day or two, after which the child suddenly becomes ill and within two days or so shows signs of paralysis in some limb, a group of muscles or a single muscle. If the child gets over the acute stage the growth of the paralysed limb is arrested and in course of time it becomes stunted and deformed. In very mild cases the general symptoms are not severe and the paralysis of the muscles so slight that it is not noticeable. The patient usually gets over the acute attack unless the muscles of respiration, throat and larynx are involved, in which case death takes place from asphyxia unless the patient is kept alive by means of some mechanical apparatus—popularly known as the iron lung—to carry on artificial respiration until the paralysed muscles regain their power.

**TREATMENT.** The patient, on the slightest sign of the disease, is isolated and kept in bed at complete rest until all acute symptoms have subsided. No physical exertion should be allowed as it is likely to increase the severity of the disease and the extent of paralysis. Diet, nursing, etc., are carried out on general lines. The paralysed limb is wrapped in cotton-wool and supported in a comfortable position between pillows. So far no specific medicine or treatment is known to cut short the disease. When the acute stage is passed and the child is out of bed the limb should be gently massaged twice daily for a few minutes at a time and put in a light splint so as to prevent the paralysed muscles to be stretched by the contraction of the opposite set of healthy muscles. This treatment is to be continued for months before the affected muscles regain their lost power. The patient should remain isolated for 4 weeks during convalescence.

**PREVENTION.** As the virus is likely to be found in healthy persons during an epidemic and in children who had a very mild or abortive attack which was not noticeable great precautions are necessary so that

the infection may not be conveyed to healthy children through the breath, etc. Kissing children is a dangerous practice especially during an epidemic, as a healthy person may convey the most virulent infection which may cost the child his life. Children should not be allowed to undergo much physical exertion during an epidemic as it increases the severity of the disease and the chances of paralysis. Crowded places, such as cinema houses, theatres, etc., should be avoided. All food and drinks for children should be protected from flies. A child who has recovered from an attack should be isolated from other children for at least four weeks. Quacks and many irregular practitioners who know nothing about the nature of the disease and the part of the body attacked by it have been publicly proclaiming the efficacy of their particular remedies, but up to the present time no specific medicine is known which can cut short the disease or reduce its severity or prevent paralysis of muscles. Mild cases recover completely with proper treatment as depicted above and many abortive cases require no special treatment except complete rest in bed.

**Psittacosis.** It is an acute infectious disease of parrots and some other birds which can be communicated to human beings by handling sick parrots. Several localised epidemics have been observed in some European countries. The incubation period is about 8 days, but in some cases may be as long as a fortnight.

The onset is sudden with chills and fever and there may be bleeding from the nose. The throat is congested and sore, there is pain in the chest and the expectoration of rust-coloured sputum indicates the involvement of the lungs. After 5 or 6 days the symptoms are aggravated with great prostration, delirium and semi-comatose condition. In cases that terminate favourably the temperature begins to come down about the end of the second week. The convalescence is prolonged.

**TREATMENT.** The patient requires careful nursing, suitable diet and rest in bed. Sulpha drugs and penicillin have been used successfully in the treatment of this disease and should be administered at an early stage.

**Pyæmia.** See Septicaemia.

**Rabies, Hydrophobia or Lyssa.** Rabies is an acute infectious disease, primarily of certain carnivorous animals, such as dogs, jackals, wolves, foxes, etc., and is transmissible to other animals also, including man. The virus of the disease is present in the saliva of the rabid dog and is conveyed to human beings or other animals through the bite. It can enter the system through a minute scratch licked by the dog. It attacks the central nervous system and produces a train of symptoms which invariably end in death. The disease is found in almost all the countries of the world except England and Australia where muzzling and quarantine laws with regard to imported animals are strictly enforced. The length of the incubation period depends on the severity of the wound and the site where it is inflicted, the nearer the brain the shorter the period. In human beings it varies between 3 and 8 weeks; in case of a severe wound on the face it may be a fortnight.

and in rare cases it may be as long as one year.

Before the commencement of the symptoms there is some itching or numbness around the scar which becomes painful; but these local symptoms are not always present. The patient becomes melancholic and depressed, has headache, loss of appetite, husky voice and difficulty of swallowing which soon increases and any attempt at swallowing is painful and causes agonizing spasms of the throat muscles, even the sight of water induces such spasms which makes the patient afraid of water, hence the name of the disease, viz., hydrophobia. The patient has a peculiar kind of dry cough on account of the difficulty of swallowing saliva and consequent dryness of the throat, which is supposed to resemble the bark of the dog. The patient becomes restless and almost maniacal but is rarely dangerous to others. The spasms extend very soon to respiratory muscles and cause difficulty of breathing. These symptoms continue from 12 to 36 hours or so after which the patient becomes thoroughly exhausted and paralysis sets in which ends in unconsciousness and death. In another variety of the disease known as dumb rabies, which is more common in animals than man, there is a feeling of heaviness and numbness in the limbs soon followed by paralysis and death.

Pseudo-hydrophobia or lyssophobia is a condition in which a group of hysterical symptoms are shown by certain neurotic persons bitten by a dog which is not rabid. These persons are in constant dread of getting the disease. In such patients the true symptoms of hydrophobia are absent, there being no spasms or paralysis of the throat or respiratory muscles, though the bark and even the biting of the dog are imitated. Food and water can be swallowed without difficulty.

**TREATMENT.** There is no specific or any treatment and once the disease is developed it invariably ends in death. The patient is kept in a quiet dark room and given small quantities of liquids at a time or nutrient enema per rectum.

As the virus is present in a virulent form in the saliva of the dog suffering from rabies and as it is not always possible to make out that the dog is rabid, all wounds inflicted by the bite of a dog and all scratches licked by a dog that is not in good health should be immediately cleaned thoroughly and cauterized so as to destroy the virus. The wound should be properly exposed and if need be incised so as to make the deepest part accessible to the chemical used. Strong nitric acid is the most efficient caustic that will destroy the virus; it should be applied with a glass rod. Even with this it is possible in a penetrating wound for some virus to escape destruction. It is, therefore, much safer to undergo antirabic injections which are now available at all headquarters hospitals. The treatment should be taken within 24 hours, as longer it is delayed the greater the chances for the disease to develop. A dog or any other animal bitten by a rabid dog can be protected in the same way.

A dog suffering from rabies shows, at a very early stage, a marked change in its disposition and behaves in a strange manner. A lively affectionate animal becomes sullen, morose, irritable and disobedient,

snaps at people and articles of furniture, eats rubbish and swallows stones. In some very rare cases it becomes excessively affectionate. It looks ill, has an unsteady gait and difficulty of walking. It becomes restless, runs about aimlessly biting anyone that comes in his way until it is thoroughly exhausted when it lies down to die. In the quiet or dumb form of rabies the dog is quiet on account of the early onset of paralysis. This form is particularly dangerous to human beings, as its presence is not suspected and the animal becomes an object of sympathy and may bite or lick persons looking after it. A rabid dog does not always show fear of water. There are some diseases of the dog that simulate rabies, such as distemper, tumour of the brain and canine hysteria. Considering the very dangerous nature of rabies any dog suspected of suffering from it should be tied up securely with a strong chain in a closed room or a secluded place and food and water provided for it regularly and the attendant should take every precaution against being bitten. If the dog is alive after eight days the chances are that it is not suffering from rabies, as the animal in whom the disease is developed dies within 8 days; in rare cases it survives for 10 days.

**Rat-bite Fever.** It is an acute infectious disease caused by a micro-organism which primarily affects rats and is conveyed to human beings by the bite of an infected rat. The disease is common in Japan where it was first noticed and described by Japanese observers. Occasional cases are reported from England, France, Italy, Germany, etc. In India sporadic cases occur in large towns. The incubation period varies from a few days to 2 months.

The wound inflicted by the bite heals without any trouble, but later on the scar becomes tender and inflamed and blisters may form on the surrounding area. The lymphatic glands nearest the site become enlarged and painful, there is a sudden attack of chills followed by fever and some prostration. This continues for 3 or 4 days when the temperature becomes normal and the patient feels better. But after an interval of about a week all the symptoms return. As a rule the relapse is not so severe as the first attack and the subsequent relapses are less severe. With the onset of fever there is a dark coloured rash on different parts of the body. The blood examined during an attack under the microscope shows spiral micro-organisms.

**TREATMENT.** The wound is cleaned and cauterised as soon as possible so as to destroy the organisms. The specific treatment, which rapidly cures the disease, consists in injecting intravenously a suitable dose of salvarsan. One injection is enough to bring about a cure, but in rare cases a second injection may be required.

**Relapsing Fever** or Famine Fever. It is an acute infectious disease caused by a spiral micro-organism which is conveyed from man to man by lice, ticks, biting flies and bed bugs. It is prevalent in many parts of the world and is endemic in Eastern Europe, India, China, Arabia and some parts of Africa. In India it breaks out in an epidemic form in famine-stricken areas. The period of incubation varies from 3 to 12 days.

The onset is sudden with chilliness, fever, headache, giddiness and thirst followed by pain in the joints, muscles and the pit of the stomach, intolerance of light, bleeding from the nose and a slight yellow tinge of the conjunctivae. The spleen and liver get enlarged and the skin dry and hot. A rash may appear on the skin but it is not easily seen on dark-skinned persons. The primary attack lasts from 4 to 7 days after which the temperature falls rapidly with profuse sweating and there may be a dangerous collapse. This is, however, not the end of the disease, as after an interval of from 5 to 10 days, the relapse comes on with all the symptoms of the initial attack which may be as severe as before, but as a rule, it is less severe and of a shorter duration. Similarly, a second and third relapse may occur, usually there are only two. With specific treatment administered the disease can be cut short. In India the disease takes a heavy toll in famine-stricken areas.

**TREATMENT.** One of the organic arsenical preparations, sold under different trade names, administered intravenously acts as specific and one injection is sufficient to cut short the disease.

**Sand-fly Fever,** or Three-day Fever. It is a specific fever of short duration lasting for 3 days. As its name implies, the infection is carried by the sand-fly. The disease is prevalent in almost all the eastern countries, south-eastern Europe, Egypt and other parts of Africa and South America. The incidence of its occurrence among new-comers to an infected locality is very high. The incubation period is from 3 to 8 days.

The onset is sudden with fever which may be as high as 104, flushing of the face, frontal headache and pain in the neck and behind the eye-balls. There is a certain amount of drowsiness with sleeplessness. After the third day the temperature comes down to normal and the patient becomes free from other symptoms except drowsiness and some weakness. The disease is mild and all cases recover. The treatment is carried out on general lines for the relief of symptoms.

**Scarlet Fever.** It is an acute infectious disease caused by a specific micro-organism. It is a disease of temperate climates but sporadic cases sometimes occur in the tropics. Children upto 8 or 10 years of age are very susceptible to it and dark people are more or less immune. The infection is conveyed by direct contact or through contaminated articles on which it remains active for a long time. The usual incubation period is from 2 to 6 days, but in rare cases may be as short as 1 and as long as 12 days.

The onset is sudden and is marked by high fever, nausea, vomiting, flushed face, sore throat and in young children convulsions. From 6 to 24 hours after the attack the rash of scarlet fever begins to make its appearance. It consists of numerous small red points which soon coalesce and form a deep red blush covering the whole body, but in mild cases it is seen in small scattered patches on the body. In the malignant variety of the disease it is very extensive and dark red in colour on account of the bleeding under the skin. The throat and tonsils are inflamed and painful. After 3 to 6 days the temperature slowly comes

down to normal. The height of temperature and the pulse rate are in proportion to the severity of the disease. Delirium is present in severe cases from the second or the third day. From the beginning there is some irritation of the kidneys and albumen is present in the urine. Nephritis, i.e., the inflammation of the kidneys, may come on during the second or the third week and is a troublesome complication which has to be guarded against from the beginning. The symptoms subside when the temperature comes down and desquamation, i.e., the shedding of the superficial layer of the skin, takes place. This commences on the chest and takes 2 to 3 weeks to complete and is in direct proportion to the severity of the disease. One attack of scarlet fever gives immunity for life and a second attack is very rare. It is very liable to be mistaken in the beginning for other infectious diseases which produce a rash, such as measles, German measles, small-pox, etc., but the characteristic symptoms of these develop within two or three days. The mortality from scarlet fever varies in different epidemics as also at different ages being highest in children under 3.

**TREATMENT.** The patient is isolated as in other infectious diseases in a quiet room from which all carpets, rugs and unnecessary furniture have been removed. Blood serum from patients who have recovered from the disease has been used with good effect. Sulpha drugs are now used and seem to have a specific effect on the disease. Complete rest in bed for at least two weeks should be enforced after the temperature becomes normal. Food should be light, and plenty of fluids should be given to flush the kidneys and saline purgatives to relieve the strain on them. The patient should be protected from chills during convalescence.

The danger of conveying the disease in clothes, toys and other articles should be remembered and all articles that have come in contact with the patient should be thoroughly disinfected. Toys, books, etc., used by the patient should be destroyed.

**Septicaemia** or Blood-poisoning. It is a condition in which any of the various disease-producing micro-organisms invade the blood-stream and produce a variety of symptoms. When it occurs without the presence of any disease in the body and the source of infection is not known it is known as primary but when the infection is derived from some disease in the body it is called secondary. The susceptibility to infection varies under different conditions and is very high in women after child-birth on account of the large raw surface in the womb. There is no fixed period of incubation which depends on the nature of the invading micro-organism and the condition of the health of the patient. The secondary variety may arise at any time during the course of the disease.

The symptoms vary a great deal and depend upon the nature of infection, but certain symptoms are common to all, such as high fever, prostration, fast pulse, headache, delirium, stupor and coma. The onset is usually sudden, the fever may be continuous, remittent, intermittent or irregular. Severe diarrhoea, vomiting, jaundice, prostration and bleeding from the gums, nose or bowels may also be present. In the acute variety these symptoms last for about a month but in the

chronic cases they continue for several months. When the pus-forming organisms have invaded the blood the disease is called pyaemia, in which abscesses break out in different parts of the body. The mortality rate in septicaemia is high and the outlook for debilitated patients is very grave.

**TREATMENT.** This consists in removing, if possible, the focus of infection if one is present in the body. The treatment for fever and other symptoms, diet, rest, etc., are the same as for other infectious diseases. Sponging the body with a cooling lotion No. 42 or wet pack (page 48, Part I) are useful in reducing the fever and allaying delirium. Sulpha drugs and penicillin or streptomycin are used with very good effect in case of micro-organisms which are found on microscopic examination to be sensitive to these drugs. Stimulants, such as brandy, strychnine, quinine and caffeine are given to keep up the action of the heart. Boils and abscesses require surgical treatment.

**Seven-Day Fever.** It is a mild acute infectious fever caused by a spiral micro-organism which is harboured by infected field mice and transmitted to man by its bite. The disease is prevalent in Japan, some parts of India and China and the East Indies. The incubation period is from 4 to 10 days. The onset is sudden with fever, headache, muscular pains, backache and digestive disturbance. These subside in about 7 days' time and leave no ill effects behind. There is no special treatment for it.

**Smallpox** or Variola. It is an acute highly infectious disease which is prevalent in all countries of the world, no climate, country or race being exempt from it. One attack, as a rule, gives immunity for life. The causative virus is not yet identified, but it is present in the patient from the very beginning of the attack and is transmitted to healthy persons by direct contact or in bedding, clothing, etc. A healthy person can also convey the infection to others without himself suffering from it. Epidemics break out usually during winter and early spring and spread rapidly among unprotected people living in crowded insanitary localities. The severity varies in different epidemics. In India the ignorant people believe that it is a visitation from the goddess of smallpox and therefore no treatment should be given lest she be offended. The incubation period is usually from 10 to 12 days but may be as short as 5 and as long as 20.

The onset is sudden like other infectious disease with fever, shivering, headache, vomiting and pain in the back; in young children convulsions are common. The temperature rises to 102 or more and remains at that level; restlessness and delirium are also present. Though the temperature is high yet the skin is covered with perspiration. This preliminary stage lasts from 3 to 4 days, but in severe cases it may be 2 days; the shortening of this stage, as a rule, indicates the severity of the disease. In some cases during this period the preliminary rash breaks out on the abdomen and thighs which resembles that produced in measles or scarlet fever. This initial rash is of short duration and disappears without leaving any marks.

The characteristic eruption of smallpox appears on the third day

from the beginning, in the shape of small round dots of a pale or dusky red colour; they soon increase in number and project above the surface of the skin. They are more abundant on the face and those parts of the skin which are subjected to frequent mechanical and chemical irritation. With the appearance of the eruption fever and other symptoms subside and the patient feels comfortable until the papules become filled with pus when the temperature rises again and continues until the eruption dries up. The mucous membrane of the mouth, throat, nose and conjunctivae are liable to be attacked by the eruption, in which case symptoms referable to these parts are produced, such as difficulty of swallowing, dry cough, hoarseness of voice and discharge from the nose. The invasion of the conjunctiva is likely to produce ulceration of the cornea and consequent blindness in that eye.

The papules continue to grow for about 5 days when they are converted into vesicles which are slightly depressed in the centre presenting the characteristic appearance found in smallpox. Within the next two days these are changed into pustules. These may be separate from one another when the disease is known as *discrete smallpox*; in severe cases they are closely set and coalesce with one another when it is known as *confluent smallpox*. After the twelfth day the pustules begin to dry and when the scab is shed each leaves a small dark pit which is deeper and more marked in the confluent variety. A mild variety of smallpox known as *modified smallpox* attacks people who have been successfully vaccinated within five years. An *abortive* type of smallpox is also known in which the eruption does not become pustular but dries up and leaves no signs behind. The most severe and very fatal type of the disease is known as *haemorrhagic smallpox* or *black smallpox* in which there is bleeding under the skin and mucous membranes and from the nose, kidneys and alimentary canal. In pregnant women the disease is particularly of a virulent type and produces abortion and fatal septicaemia.

**TREATMENT.** The best place to treat a case of smallpox is the isolation hospital, both in his own interest and in the interest of others, where he can receive the best medical help. If treated at home he should be isolated in a dark well ventilated room containing only a few necessary articles of furniture and should remain there until all scabs have come off. The diet should be plain and not contain animal protein in the shape of broth or meat extractives. For pain in the throat and difficulty of swallowing a piece of ice may be given to suck. No diaphoretic is needed for fever. In the beginning, if the patient's condition allows, a warm bath is given and the body dried with a clean towel without much friction. The throat and nostrils should be painted with carbolized glycerin and the body dusted with zinc and boric powder (No. 138). The eyes should be washed thrice daily with a 2% lotion of boric acid or a couple of drops of 5% argyrol solution. The eruption, if undisturbed, tends to heal by itself and needs no special treatment. Friction of the parts should be avoided as also exposure to sunlight or actinic rays. When the scabs become dry and begin to drop the skin should be smeared with carbolized vaseline. Vaccination against the disease is the only certain method of protection and every

child, before it is six months old, should be vaccinated, this should be repeated after five years.

**Tetanus** or Lockjaw. It is a communicable disease caused by a specific micro-organism which is abundantly present in road dust, richly manured soil and the intestinal contents of many herbivorous animals. It enters the body through a wound, particularly a punctured or lacerated one and grows rapidly producing a virulent toxin which travels along the nerve trunks to the central nervous system where it poisons the nerve cells. Occasionally, cases are met with in which there is no visible injury, such cases are known as *idiopathic tetanus*. Outside the body the infection remains active for a long time. Many animals, such as the horse, donkey, etc., are susceptible to the disease. The incubation period of acute tetanus in man varies from 5 to 8 days, but may be as short as 3 and as long as 20. The shorter the period the more severe the attack.

In many cases there are some premonitory symptoms a day or two before the manifestation of the disease, the patient feels restless and irritable and has some stiffness about the site of infection. These preliminary symptoms may be very mild or absent. It is very important to recognise these early symptoms as the chances of recovery are better if the specific serum treatment is administered before the disease fully develops. In children the onset is marked by frequent general convulsions which might be fatal. The neck soon becomes rigid after the preliminary symptoms and the jaw becomes quite stiff so that the patient is unable to open his mouth. The muscles of the face are also involved and the angles of the mouth are drawn out producing a peculiar expression which is known as sardonic laugh. The body becomes stiff and curved backward or forward on account of the rigidity of muscles; in addition to this there are frequent painful spasms which are precipitated by any kind of stimulus, such as a loud noise, a draught of wind or handling the patient. Fatal choking may result at any time from prolonged spasms of the respiratory muscles and the diaphragm. The patient is soon exhausted on account of constant spasms and inability to take food.

In some patients a local form of tetanus develops in which the muscles in the vicinity of the infected site alone are affected. This happens in patients who have received an inadequate dose of the antitetanic serum as a prophylactic.

**TREATMENT.** The wound responsible for producing the disease should receive immediate attention so as to prevent further production and absorption of the toxin. The patient is kept in bed in a quiet darkened room and disturbed as little as possible. As mastication and swallowing are impossible diet should be liquid containing sufficient nourishment. To relieve the spasms and lessen pain sedative drugs, such as 3 to 5 grains of luminal or 15 to 20 grains of chloretone with a little water, are given by the mouth or double the quantity per rectum thrice a day. A subcutaneous injection of 6 to 10 c.c. of a 25% solution of magnesium sulphate in water is also given to control the spasms.

The specific treatment of tetanus consists in very early administration

of the antitetanic serum in sufficient doses intravenously or intraspinally. It is beneficial if given during the premonitory stage and before the disease is fully developed. The method of administration and the dosage are determined from the condition of the patient. The usual method is to inject 5000 units of the serum as soon as possible into the spinal canal and 20000 to 30000 units intravenously at the same time. This is repeated the next day and after that the intravenous injection is given on the third day. Before the full dose is injected on the first day it is advisable to determine if the patient is sensitive to the serum. This is done by giving him an injection of 1 c.c. of the serum subcutaneously. If he is sensitive he will immediately get difficulty of breathing, lividity of the face, restlessness and fast pulse, in which case the serum is not given for 3 or 4 hours. The initial dose of 1 c.c. given will by that time desensitize the patient when the full dose as stated above should be given. Much larger quantities of the serum are given in severe cases.

Mortality rate of tetanus is very high and it is very fatal to infants and children. All lacerated and punctured wounds and those contaminated with garden soil or road dust should receive prompt surgical treatment and should receive, as a routine, a prophylactic dose of 1500 to 3000 units of the antitetanic serum within 24 hours or as early as possible. This has to be repeated if the wound is not healthy and is suppurating.

**Trypanosomiasis** or Sleeping Sickness. It is a chronic communicable disease prevalent in Equatorial Africa, mostly along the course of the Congo and its tributaries and some parts of South America. It is caused by a microscopic animal parasite which originally lives in the blood of certain vertebrate animals and is conveyed to other animals and man by the tsetse fly (*q.v.*, page 163, Part I) which is a biting insect. Many areas, where the fly is found in large numbers, have become uninhabitable to man and beast. The incubation period of sleeping sickness in human beings is about 14 days.

The bite of the infected fly is followed by some irritation or inflammation which lasts for a few days. After some days the patient is attacked by fever of an irregular type which continues for some days and then disappears to recur again after an interval. The repeated attacks of fever make him weak, anaemic and emaciated. There are headache, palpitation and enlargement of the lymphatic glands all over the body. These symptoms, with occasional remission, continue for months or years or as it happens in a large majority of cases, at any time during the course of the disease the terminal stage might set in which ends in death. The symptoms are markedly aggravated, the patient has a vacant expression with puffiness and drooping of the eyelids, physical and mental prostration and a tendency to pass into a state of somnolence resembling sleep from which he could be roused to take his food but falls off to sleep while eating. The lethargic condition deepens and the patient is unable to get out of bed and dies in a comatose condition. The mortality rate in Africa among the native population is very high and in some places whole villages have been

depopulated.

**TREATMENT.** The treatment to be of any use should be undertaken at a very early stage, because once the disease is well established nothing is likely to do any good. The drugs used with benefit are organic compounds of arsenic or antimony which are sold under different trade names. Of these tryparsamide, which is an arsenical preparation, is administered intravenously or intramuscularly in doses varying from 1 to 4 grams dissolved in 10 c.c. of freshly distilled water. The initial dose is 1 gram which is gradually increased every week. Another drug given in the same way is called Bayer 205 or antripol, it is given intravenously. The patient should be removed from the locality where he has contracted the disease.

Persons living in or frequenting infected areas should take all precautions against being bitten by the fly. It is not active in darkness, so that if an endemic area has to be traversed the journey should be undertaken during dark nights.

**Tuberculosis.** Tuberculosis is ordinarily a chronic infectious disease affecting mostly the lungs but may attack any part or organ of the body. It is caused by a micro-organism known as tubercle bacillus, as it produces a small tubercle in the tissue where it lodges and grows. This tubercle, in course of time, softens and breaks down forming a small cavity or an ulcer if it is on the surface. The cavity becomes infected with pus-forming microbes which cause great destruction. The infection may remain localised in the part first affected or may be disseminated to other parts. It sometimes appears in an acute and virulent form, especially in children and involves many parts simultaneously when it is called *acute miliary tuberculosis* which ends in death within a short time. Many domestic animals, particularly the cattle and pigs, are liable to suffer from it; it is very rare in wild animals. In cattle it is called *bovine tuberculosis*.

The bacillus remains active for a very long time outside the body in a dried state and is capable of causing the disease even after a year or 18 months. Houses occupied by tuberculous patients are, therefore, dangerous to live in unless thoroughly disinfected. The bacillus is very resistant to ordinary methods of sterilization and requires a continuous exposure to sunlight for 7 hours to kill it. The sputum of a patient contains millions of active bacilli, which, when dried, are wafted into the atmospheric air with dust and enter the body with the inhaled air. The fine spray produced by coughing, sneezing or speaking contains the bacilli and constitutes a great danger to medical attendants, nurses and those who come in close association with the patient. The process of cooking destroys them. They are present in large numbers in the milk of diseased cattle and readily gain an entrance into the body unless the milk is properly sterilized.

The tubercle bacillus is most universally distributed and though it is a formidable cause of disease and death, it fortunately does not take root in the body in every case in which it gains an entrance and in many cases when it produces the disease is readily overcome by the natural resistance of the body. Few individuals in this world escape

the infection, but like many other diseases it requires certain predisposing conditions to produce the disease. Any condition that lowers the vitality of the body is favourable for its growth. There is also an inherited tendency to the disease in certain individuals and families. There is no definite period of incubation and the disease might manifest itself months after the infection.

The symptoms produced by the disease are many and varied and are referred to the part that is affected. Tuberculosis of the lungs is usually a chronic disease and is known as consumption or phthisis. Occasionally, it manifests itself in an acute form simulating pneumonia and is rapidly fatal. The onset of the chronic form is insidious and in the beginning symptoms of a slight cold with dry cough, impaired appetite and digestion and slight rise of temperature are present. There is little or no sputum or a small quantity of frothy liquid is expectorated with the cough. It gradually increases in quantity and becomes purulent when the destructive process in the lungs has advanced. Haemoptysis, i.e., bleeding from the lungs, is fairly common among young patients; it is scanty in the early stage, a little red streak of blood being present in the sputum. Late in the disease profuse bleeding takes place in some cases due to ulceration of one of the blood vessels in the lung which may be fatal. Occasionally, bleeding is the first symptom noticed by the patient who has apparently been in good health. It occurs after physical exertion or at night when the patient is in bed.

Pain in the chest is slight and is not always a prominent symptom. Fever is present when the disease is active, the temperature shows a rise in the evening coming down to normal at night with perspiration which may be profuse and exhausting. Progressive loss of weight and strength is a constant and an important symptom and is a good indication of the progress of the disease. Nausea, impaired appetite and constipation are present in the beginning, but late in the disease obstinate diarrhoea supervenes when the intestines are invaded. All the symptoms progress steadily until the patient is thoroughly exhausted and is confined to bed until death takes place. He retains his mental faculties till the last.

In the early stages when the symptoms are indefinite an X-ray examination is helpful in detecting the disease, but a negative result is not so dependable. Tuberculin, which is an emulsion of the dead culture of the bacillus, was at one time used for diagnostic purposes in what is called the cutaneous test (Von Pirquet's Test) but it is not reliable. Before the introduction of the modern methods of treatment for tuberculosis the outlook for a patient with well developed symptoms was not bright.

**TREATMENT.** Numerous drugs have been, from time to time, recommended in the treatment of phthisis, but most of them have been disappointing. The most successful measures have been those which promote general health and increase the natural resistance of the body and guard against complications. Recently streptomycin, a drug prepared from a fungus in the same way as penicillin, has been tried with good results. Whenever possible the patient should be removed

as early as possible to a sanatorium for treatment, where he can receive regular treatment under expert supervision and where his progress can be watched from day to day. He can also have a complete change of scene which will be of great benefit to his mental condition. Moreover, such sanatoria are located in places whose climate is found to be beneficial to tuberculous patients. Home treatment, however carefully carried out, is likely to be perfunctory in the long run, as the course of the disease is prolonged and tedious. If treated at home the patient should be kept in the sunniest and best ventilated room or in an open verandah, properly protected against wind, rain and dust. Absolute rest in bed is the most essential part of the treatment and is strictly enforced as long as there is fever and for 4 weeks at least after the temperature is normal. The patient should not get out of bed on any account, nor be subjected to any kind of strain, such as talking to visitors, prolonged reading, etc. Bathing should be avoided as long as there is fever, but sponge baths twice a week or oftener in hot weather may be allowed. He should remain in the open air as much as possible or for 24 hours. For this purpose the bed is kept in an open verandah having at least two sides open. Sun-bathing is of great benefit if properly carried out and when there is no fever. In the beginning, only the limbs should be exposed to mild sunlight in the morning for not more than 2 or 3 minutes gradually increased to 5. After some time the whole body may be exposed for 2 minutes to start with and very gradually increased to 10. The head should be protected with a broad-rimmed hat and the eyes with dark sun-glasses. If at any time the patient feels uncomfortable or gets fever it should be discontinued until he feels well again.

Various dry and bracing climates, especially of places elevated above the sea level, are very beneficial for the treatment of tuberculosis and even advanced cases do well as long as they remain there. In India some few sanatoria have been established in such places, but unfortunately their number and the accommodation available are limited.

Diet is another very important factor in the treatment of tuberculosis, which requires care and ingenuity in its adjustment so as to be light, nourishing, properly balanced, sufficient in quantity without being monotonous or unduly straining the patient's power of digestion. In arranging the diet individual taste and peculiarities should be taken into consideration. Although it is necessary for him to put on weight, overfeeding should be avoided. For patients whose digestion is good three ordinary meals a day at regular intervals should be allowed with as much milk, cream, eggs and olive oil as can be easily digested. Patients who are having fever or whose digestion is weak should avoid meat and other solid nitrogenous food until the condition improves. The patient's mental condition requires as much care as his physical health; he should have no worries and everything should be done to promote a cheerful optimistic attitude of mind. He should be explained the nature of the disease and the possibility of cure if all instructions are strictly observed.

No exercise is allowed as long as the temperature has not remained normal for at least 4 months. In the beginning he should remain in a comfortable reclining chair for a couple of minutes which should be

very gradually increased until he is able to walk for ten minutes without any discomfort; he may then be taken out for a short drive on a dustless road. During all this period his temperature is to be carefully watched and if there is any rise or any acceleration of the pulse he should return to bed for a week or 10 days.

Many quack medicines are advertised in papers guaranteed to cure tuberculosis, but these are not only useless but actually harmful. In modern sanatorium treatment few drugs are used and only to combat certain troublesome symptoms. Cod liver or halibut oil and their various palatable preparations have been used for years and are useful in promoting the resistance of the body. Tuberculin was, at one time, used as a curative but its use is not free from risk. In order to give complete rest to the affected lung, artificial pneumothorax is introduced as a therapeutic measure with considerable success. This consists in letting in some inert gas, such as nitrogen into the thoracic cavity between the lung and the chest wall so as to cause the lung on that side to collapse. Streptomycin, which is a preparation obtained from a fungus in the same way as penicillin, is now introduced in the treatment of tuberculosis and has given good results. It is very likely the tubercle bacillus will soon lose its terror.

Very few human beings living under modern civilized conditions escape infection with tubercle bacillus, but the disease does not find a favourable soil for its development in every person and in many cases the attack is so mild that a spontaneous cure takes place without producing any appreciable symptoms. The preventive measures consist in keeping the body in a healthy condition and in avoiding all possible sources of infection. Children are very susceptible to it, they should, therefore, be prevented from coming in contact with consumptive patients. The convalescence period after an infectious fever is particularly a dangerous time as the resistance of the body is much lowered. If a house, previously occupied by a consumptive, has to be occupied, the floors and walls should be well scrubbed and treated with a 5% solution of cresol and the doors, windows and walls colour washed and all doors and windows kept open for a week before it is occupied.

General measures for preventing the spread of tuberculosis consist in spreading the knowledge about the disease and the way in which the infection is disseminated by patients and in improving the living conditions and dietary of the poorer classes. Spitting in public should be prohibited by law and the prohibition strictly enforced. The patients should be instructed to spit in a spittoon containing some strong antiseptic fluid.

**Acute Tuberculosis of the Lungs.** An attack of acute tuberculosis of the lungs occasionally occurs in grown up persons who have apparently been in good health. The symptoms resemble those of pneumonia, but instead of terminating like pneumonia, it either passes into a chronic condition or ends in death within a few days. The onset is sudden with chills, high fever, cough and rust-coloured sputum. The fever is remittent in type and does not come down by crisis as in pneumonia but remains high. Rapid loss of weight, great weakness,

excessive sweating and excessive and purulent sputum are the more prominent symptoms. Death may take place within a few days or the disease might pass into a chronic condition and drag on for weeks or months before death takes place. The treatment is carried out on the same lines as described above.

**Acute Miliary Tuberculosis.** In this disease most of the organs are simultaneously invaded by tubercle bacilli in a virulent form. On account of the very wide dissemination of the disease the amount of toxin produced is so great that it proves fatal in a very short time. It manifests itself in three different types according to symptoms referable to particular organs. These are, *meningeal*, in which symptoms referable to meninges are predominant, *typhoid*, in which there is extreme prostration, and *pulmonary*, in which the main symptoms are referred to the lungs. The meningeal type is more common in children than adults. Its onset is gradual with progressive loss of weight and strength, digestive disturbances, evening rise of temperature, headache and sleeplessness. These symptoms continue for weeks or months before the onset of meningeal symptoms. The headache becomes constant and severe with vomiting and constipation. The child often cries out from headache. The vomiting bears no relation to eating and occurs without any apparent cause. This early stage soon passes into one of stupor; the child lies listless and drowsy on one side, turns his head away from light and resents being disturbed. The neck is stiff and the movement limited and painful. The condition gets progressively worse and ends in death. The onset of the typhoid variety is gradual with digestive disturbances, headache, progressive loss of weight, prostration and sometimes bleeding from the nose. The patient ultimately passes into a state of coma before death. The pulmonary type is more often found in adults and may occur as a primary condition or follows chronic pulmonary tuberculosis. Fever and cough are present, the loss of strength and prostration are well marked and the signs of deficient oxygenation of the blood, viz., blue coloration of the face and the extremities and rapid breathing, are present. The mind becomes dull and hazy and a state of drowsiness and coma supervenes before death. The duration of the disease is about 4 weeks. The treatment of these conditions is carried out on the same lines as for chronic tuberculosis.

**Tuberculosis of Other Organs.** Apart from the secondary involvement of other organs in the course of chronic tuberculosis of the lungs, other organs in the body are primarily affected, such as alimentary canal, urinary system, lymphatic glands, nervous system, skin, bones and joints.

**Tuberculosis of the Alimentary Tract.** Usually the tubercular lesions in the mouth, throat and palate are secondary to the lung affection but they may be primary. A chronic ulcer forms which resists ordinary treatment and slowly spreads. This is likely to be mistaken for cancer or syphilitic disease. Intestinal tuberculosis is mostly secondary and is caused by swallowing the bacilli with the sputum. In the early stage there are no symptoms referable to the abdomen. When the

disease is well advanced there is very obstinate and troublesome diarrhoea with mucus, blood and pus in the stools, pain in the abdomen and rigidity of the abdominal muscles. The disease may drag on for years or end in death within some months.

**Tuberculosis of the Urinary Organs.** It appears as a primary disease usually in one kidney and in course of time spreads to the bladder. When the disease is well established pus and blood are found in the urine and pain in the loin on the affected side. General symptoms of tuberculosis, viz., fever, loss of weight and digestive trouble, are present. When the bladder is involved, pain while passing water and frequent micturition become troublesome. The treatment is on the same lines as for chronic tuberculosis. If only one kidney is involved it can be removed.

The testis may be affected primarily or infected from the disease in the bladder. The condition is very chronic, but if detected early it yields to treatment. In case the organ is destroyed it has to be removed as soon as possible.

**Tuberculosis of the Meninges.** This is usually due to a secondary infection from some chronic focus in the body and is much more common in children than adults. It may be a part of the acute general infection affecting many organs simultaneously or may be a primary condition. The onset is ushered in by intense headache, high fever, irritability, vomiting and convulsions. Stiffness of the neck and pain on movement are prominent symptoms. Depression and drowsiness soon supervene and the child lies quiet, turns his face away from light and resents being disturbed. The symptoms get progressively worse and death takes place within 2 or 3 weeks.

**Tuberculosis of the Lymphatic Glands.** This is a chronic complaint which mostly attacks children. The bacilli which are present in food or milk gain an entrance into the body through the mucous membrane of the mouth, throat or tonsils and are arrested by the glands of the neck where they grow and multiply. One or more glands are affected and sometimes a chain of enlarged glands is seen on one or both sides of the neck. This is known as scrofula, but the term is often applied loosely to other conditions of the glands. The glands become soft and break down producing chronic suppuration. Lymphatic glands in the chest and abdomen are liable to be affected. The treatment is the same as for other chronic tubercular conditions. If the glands do not yield to treatment and show a tendency to soften, the best treatment is to have them taken out by a surgical operation which leaves a clean linear scar and does away with the possibility of general infection of the body.

**Tuberculosis of the Skin.** The skin is affected by the bacillus in different ways; in one variety in which the skin of the nose and cheeks is attacked, it commences as a small soft nodule which grows in size, and similar other nodules grow in its vicinity producing a patch of such growth which extends beyond the margins while it heals where it first started leaving a disfiguring scar. If neglected the patch gets infected with pyogenic organisms or the disease spreads to the cartilage of the nose

and destroys it. The disease is not common in the tropical countries, probably on account of the inhibitive effect of strong actinic sunlight it does not grow on such an exposed part of the body. It is a common disease in cold countries among young people of poorer classes. The treatment is directed towards the improvement of general health as for chronic tuberculosis. A small nodule can be removed surgically without leaving an appreciable scar. Locally the application of Finsen light, radium or dry snow is beneficial. In old cases X-rays are harmful while in early cases radium gives very good results. The exposure of the part to bright sunlight is the best and cheapest remedy in tropical countries. In the beginning the part is exposed for not more than 2 or 3 minutes to the direct rays of the sun and the time gradually increased by one minute until the exposure can be given for 10 to 15 minutes without producing any strong local reaction, such as redness, pain or blisters. In case of such a reaction the time of exposure is reduced for a few days. Unless there is a secondary infection decided improvement is noticeable in a fortnight.

Another form in which tuberculosis of the skin is found is a limited lesion on the finger met with in mortuary attendants and butchers who get infected by handling dead bodies or meat of tuberculous cattle. It begins as a small wart which grows in size and unless removed or destroyed by caustics tends to spread and break down. Other tubercular lesions of the skin are met with in different parts of the body from primary or secondary infection. The treatment for these is adopted on the same lines.

**Tuberculous Disease of the Bone.** Tuberculosis of the bone is a chronic disease and is very gradual in onset. It produces a slow growing swelling which is hard at first and tender on pressure but not painful. After a time the bony tissue breaks down and an abscess is formed which is soft to the touch and may open on the surface discharging pus without any tendency to heal. A sinus, i.e., a suppurating tract, is formed leading to the diseased bone. The infection of the abscess by other microbes causes further damage to the bone. The joint in the vicinity of the affected bone is liable to be involved. Children whose health is run down or who have recently recovered from an acute infectious disease are very prone to get it, the immediate cause being some slight injury to the part. The same treatment as for chronic tuberculosis is needed for the improvement of the general health. The affected part requires complete rest and the application of "Scott's Dressing."

**Tuberculous Disease of the Spine.** It is also known as Pott's Disease. It attacks and destroys the bodies of the spinal vertebrae and produces the deformity known as *angular curvature of the spine*, popularly called humpback. The disease is usually met with in children under the age of ten but may be found at other ages also. In addition to the general symptoms of chronic tuberculosis, pain, rigidity and deformity of the spine, abscess and symptoms of pressure on the spinal nerves are produced. Pain is an early symptom which can be elicited by pressure on the spine or by bending and twisting the body. Neuralgic

pain is caused in the course of nerves by pressure on the roots emerging from the spine. Rigidity is due to the contraction of the muscles of the spine and is an attempt of nature to immobilize the diseased part and keep it at rest. The back is held stiff and the patient avoids all bending, stretching or twisting movements. This rigidity can be demonstrated when the patient is asked to pick up an object from the floor. Instead of bending forward he will lower himself to a sitting position by bending the knees and hips to reach it. If the cervical part is affected the neck is kept stiff and the head supported by hands. If the case is not taken in hand early the deformity of the spine is sure to take place, his height adversely affected and sooner or later pus is formed. The abscess becomes very extensive before it comes to the surface in the back, buttocks, groin or thigh. The abscess does not give much pain until it is infected with septic micro-organisms which add to the seriousness of the trouble and may be fatal.

The treatment for the improvement of the general health is the same as for chronic tuberculosis elsewhere. The local treatment consists in giving the affected part complete rest so as to promote healing and prevent the deformity. For this purpose the child is put to bed at once and not allowed to get up on any account. It may be necessary to keep him in bed for six months or longer. If the spine shows any signs of the deformity an extension apparatus will have to be applied to correct it. If this is done early the deformity can be prevented or minimised considerably and the process of healing accelerated. When pain and stiffness have disappeared completely the patient is allowed to get up with a plaster jacket or some kind of spinal support to prevent any weight falling on the spine. Early adoption of these measures will prevent the formation of abscess, but when one is formed surgical treatment would be necessary.

**Tuberculous Disease of Joints.** Persons in a low state of health living under insanitary conditions are predisposed to it, the immediate cause being a slight injury which has been neglected on account of its trivial nature. As a rule severe injuries are less liable to be followed by it, because such injuries call for energetic treatment and the reaction produced thereby prevents the growth of the bacilli that might be present. The disease is very insidious in onset with mild early symptoms. Pain can be elicited by movement, twisting or jarring of the joint. There is swelling which slowly increases and the movements of the joint are limited. All these symptoms are aggravated as the disease advances, the swelling becomes larger and the joint is crippled. If left to itself suppuration takes place and destroys the joint or the patient dies from miliary tuberculosis.

The disease is amenable to treatment if taken in hand early and may leave the joint in a normal condition. As for other tuberculous conditions absolute rest to the affected joint is quite necessary as also measures for the improvement of general health. The application of mild counter-irritants to the affected part is beneficial in the early stage. Another very useful measure is to produce congestion of blood by artificial means; this is known as Bier's method and consists in applying a bandage,

preferably an elastic one, above the joint with just enough pressure to prevent the flow of blood in the veins without obstructing the arterial circulation. In the beginning the bandage is kept on for about ten minutes and the time very gradually increased to one hour. This treatment is not suitable when suppuration has taken place which requires surgical treatment.

**Typhoid Fever** or Enteric Fever. It is an acute infectious disease caused by a micro-organism called typhoid bacillus, which is found in abundance in the urine and stools of the patient and which is conveyed to healthy persons in food or water contaminated by it. Some patients, who have recovered from the disease, harbour the bacilli in their intestine, gall-bladder, and urinary organs and may contaminate food or drink by handling it. The fly plays an important part in spreading the infection; it not only carries it on its body, but also harbours the bacilli in its alimentary canal and discharges them on food in its excreta and vomit. Oysters also convey the infection if their beds are situated in the vicinity of the sewage discharge. Nurses and sick attendants who are not careful in cleaning their hands run the risk of catching it. The bacilli can remain active outside the body for a long time and grow readily in food, milk and fresh or salt water. The disease is prevalent in all the countries of the world, but is more so where sanitary arrangements as regards water-supply and disposal of sewage are defective. Until the introduction of anti-typhoid inoculation it used to take a heavy toll of the armies in the field. One attack, as a rule, gives immunity for life. Its incubation period is 14 days, but in some cases may be as short as 5 and as long as 21.

The course of the disease from its onset can be divided into three stages, viz., the period of invasion, that of acme or full development, and defervescence. The onset, as a rule, is gradual, the patient not feeling sufficiently ill for the first 4 or 5 days to take to bed struggles to carry on with his work. A dull headache, lassitude, incapacity for much physical or mental work, loss of appetite and aching of the limbs and back are present from the beginning which slowly increase and compel the patient to take to bed. Bleeding from the nose is present in some patients. The temperature shows a rise of 1 to 2 degrees in the evening and a drop of less than this in the morning until it reaches 103 or 104 in a week's time when it remains at that height with a very slight morning remission.

The stage of acme or *fastigium* is reached by the end of the first week when the condition of the patient becomes characteristic of the disease. During this period the fever remains high and constipation, which is present in the beginning, gives place to diarrhoea. The stools are watery, greyish brown and offensive; from their colour and consistence they are called "pea-soup" stools of typhoid. The pulse rate is low being about 100 a minute. A sudden rise in pulse rate indicates the onset of some complication, such as perforation or bleeding from the bowels, pneumonia, etc. The tongue is characteristic, being dry and coated with a thick layer of dark fur in the middle leaving

the sides and the tip clear and pink red in colour. The spleen gets enlarged and the abdomen distended and tender to pressure. By the time these symptoms have fully developed the patient passes into a state of prostration known as the *typhoid state*. He lies on his back listless and drowsy and may be delirious. Profound nervous depression is seen in tremors of the tongue, hesitating speech, twitching of muscles, and passing the stool and urine in bed. Sleeplessness is present from the beginning and is very troublesome.

The characteristic eruption of typhoid, which is not seen in mild cases and dark-skinned people, appears towards the end of the first week; it is known from its colour as the *rose spots* of typhoid and consists of small round red spots, slightly raised above the surface and somewhat firmer than the surrounding skin. It is mostly seen on the abdomen but may be present on the chest and back, rarely on the face and limbs. It appears in crops of a few spots at a time and fades after 3 or 4 days. These symptoms with varying severity continue for about a fortnight and death might take place at any time from gradual failure of the heart, excessive bleeding from the bowel or its perforation. In favourable cases, about the end of the third week, sometimes a little later, the patient's condition begins to improve, his mind clears, he gets sleep, delirium disappears, urine increases in quantity and diarrhoea abates. The temperature drops about two degrees in the morning and does not rise to the same level in the evening, reaching the normal line in a week's time.

In a certain number of cases, a week or ten days after the temperature has become normal a relapse takes place and all the symptoms return. It is called *recrudescence* if before the establishment of *defervescence* the symptoms become aggravated. The relapse is usually milder and of a shorter duration; in rare cases it is severe and ends in death. It is often attributed to dietetic errors, physical exertion or emotional disturbance but it often comes on in the absence of any of these causes.

Typhoid fever does not always run the typical course described above, instead of a gradual onset it may come on suddenly with chills and fever which does not follow the usual course. In infants and young children the early symptoms are vomiting, diarrhoea or convulsions. In older children the disease usually runs a mild course. A very severe variety is known as *haemorrhagic typhoid* in which there is a tendency to bleed from various mucous membranes and under the skin. In some cases instead of terminating after 4 weeks it drags on for 3 or 4 months when it is known as *prolonged typhoid*. In another variety called *apyrexial typhoid* the fever is either absent or so slight as not to be noticeable at all. This variety is not necessarily a mild one. Other varieties of the disease, such as *meningeal*, *pneumonic*, etc., are so named on account of the predominance of symptoms referable to different organs.

Very few patients get well without some complication and most of the fatal cases are due to complications. Bleeding from the bowel, which takes place during the third week or later, is a serious compli-

cation. A small quantity of blood is present in many cases which is not of any serious consequence, but when a large blood vessel is eroded it is profuse and causes death from bleeding. In the beginning a small quantity of dark tarry blood is seen in the stool but later on large quantities of bright red blood is passed. There is chilliness with fall of temperature, pallor of the skin, coldness of the extremities, and restlessness when severe bleeding takes place. The perforation of the intestinal wall is a very dangerous and fatal complication and occurs towards the end of the second week or a little later. It is rare in children. There is sudden and severe pain in the abdomen with vomiting, hiccough, abdominal distension and a sudden rise or fall of the temperature when the perforation occurs. As this happens when the patient's condition is low these symptoms are not noticeable or are attributed to some other cause. It has been found that the incidence of perforation is higher in patients who have been kept on milk or low liquid diet than in those who are given a more liberal diet. In case the perforation is detected as soon as it occurs and before peritonitis has set in, the only chance of saving the patient's life lies in a surgical operation, which is a serious undertaking in such a low condition of the patient. Complete loss of hair after an attack of typhoid is a common occurrence which requires no treatment as the hair returns when the patient regains his normal health. Weakness of the heart muscle is the usual complication and in some cases death takes place from failure of the heart.

**TREATMENT.** Whenever possible, a patient suffering from or even suspected of suffering from typhoid, should immediately be transferred to hospital, if one is available, because absolute rest, careful nursing and constant watching are very essential for the successful treatment of the disease and the chances of recovery are decidedly affected by the treatment given to the patient in the earlier stages. If treated at home he should be immediately put to bed at absolute rest in a bright well ventilated room with a bathroom attached which should not be used by others and which should be made fly-proof. He should be provided with bedpan and urinal and on no account get out of bed for at least a fortnight after the temperature has become normal or until allowed by the doctor. As proper nursing is the most important part of the treatment, qualified nurses should be engaged for day and night. A bed with a soft mattress should be provided for the patient and all precautions taken against the formation of bedsores (*q.v.* page 31, Part I).

The diet is another very important element in the treatment of typhoid and it should be so arranged as to avoid undernourishment or overfeeding. In old days the tendency was towards underfeeding and milk was the only food allowed under the mistaken belief that solid food was likely to irritate the inflamed bowel and cause bleeding or perforation. But all solid food, by the time it reaches the intestine, is converted into a homogeneous liquid. Milk alone does not contain sufficient nourishment to sustain the patient's strength for a prolonged period and the patient soon takes a dislike to it. A liberal diet, which

is light and nourishing, not only tempts the appetite, but enables the patient to offer a better resistance. The following items may be included in the diet which should be varied from day to day: thin bread, cream, sago, arrowroot, rice, eggs, thin toast, biscuits, mashed potatoes, butter, chicken jelly, junket, boiled custard and oatmeal. The quantity should be adjusted according to the age and physical condition of the patient. Plain water, butter-milk and fruit juice should be given as much as possible. The mouth and tongue should be cleaned several times during the day, particularly before feeding.

Drugs, except chloromycetin, do not play an important part in the treatment of typhoid and are used very sparingly to combat certain symptoms. For troublesome headache aspirin and caffeine powder (No. 135) may be used for the first 3 or 4 days, but they should be discontinued soon on account of their depressing effect on the heart. Purgatives are harmful and should not be given except in the early stage when a mild saline draught might be given to relieve constipation if present. Later a daily enema may be used if necessary. Diarrhoea is rarely troublesome and can be relieved by correcting the diet. If obstinate, cooked fruits, cream and milk might be reduced or stopped for a time and 20 grains of bismuth subnitrate alone or combined with an equal quantity of aromatic chalk powder might be given 2 or 3 times until it stops. If the stools are offensive 7 grains of salol might be given. If flatulence is troublesome turpentine stupes on the abdomen and a daily enema are useful, but if it persists, milk, sugar, and cooked fruit should be reduced or omitted for a few days. Free use of butter-milk prevents distension and other abdominal complications.

Fever, if not high, does not require any special treatment except an ice-bag to the head. Persistent high fever is treated with cold bath, wet pack (*q.v.* page 48, Part I), etc. Hydrotherapy has been used in the treatment of typhoid fever for many years and is of undoubted value if judiciously applied. Its primary object is not the reduction of temperature but to increase the feeling of well-being of the patient, as it relieves sleeplessness and increases the flow of urine which helps to eliminate the toxin from the system. It is applied in different ways, viz., a cold bath, wet-pack, sponging, etc. The only contraindication is a very low condition of the patient and the presence of delirium. In very depressed circulation, great prostration and low muttering delirium alcoholic stimulant in the form of brandy or whisky is given in small and repeated doses. For persistent sleeplessness or violent delirium one of the sedatives, such as barbitol five grains by the mouth or  $1/4$  to  $1/3$  grain of codeine subcutaneously, may be occasionally given. Retention of urine is a common trouble in typhoid, it requires hot fomentation to the bladder and an enema or may require the use of a catheter. A soft rubber catheter, which is well sterilized, may be used.

The bleeding from the intestine calls for absolute rest and withdrawal of all solid food by the mouth, only water being allowed in sufficient quantities. An ice-bag or a coil or lead tubing through which ice-cold water is made to flow uninterruptedly may be applied to the abdomen. Twenty grains of chloride or lactate of calcium are given by the mouth

three times a day to promote the clotting of blood. If the patient collapses from great loss of blood transfusion of blood or blood-serum will be necessary. Perforation of the bowel is a very grave complication and calls for immediate surgical help if the life of the patient is to be saved. Even after a surgical operation the mortality rate is very high, as on account of the low condition of the patient the operation is not well borne. A small dose of morphia is given subcutaneously to stop the movement of the intestine so that the contents may not escape into the peritoneal cavity. The heart muscle is weakened by the toxin and unless proper precautions are taken from the beginning to conserve its strength death may take place from heart failure. Vaccine treatment is used in typhoid but it is useful only in mild or moderately severe cases. Recently chloromycetin, which like penicillin is a preparation obtained from one of the fungi, is used in the treatment of typhoid fever with very encouraging results. It is found to shorten the duration of the disease and prevents complications. It has to be continued for a week after the temperature is normal, as otherwise a relapse is likely to take place. There are every prospects of the disease being brought under control in the near future.

The anti-typhoid inoculation is the surest method of protection against the disease. It has now practically abolished the disease from the field armies. Every person visiting or residing in an endemic area and all nurses and sick attendants on a case of typhoid and all the residents in the house should get themselves inoculated. All persons coming in contact with the patient should wash and disinfect their hands, especially before taking their meals. A triple vaccine for typhoid and paratyphoid A and B is available. The immunity conferred lasts for 2 years or so.

Like cholera the infection of typhoid is conveyed in food, milk and drinking water which are contaminated by the faecal matter or urine of a patient or a carrier, and flies play an important part in spreading the infection; it is therefore necessary to adopt anti-fly measures constantly and protect all food and drinks from these insects. The stools and urine passed by the patient should be immediately treated with some strong antiseptic lotion and kept under cover. All articles that have come in contact with the patient should be similarly dealt with. Oysters are a frequent source of infection, especially if their beds are in the vicinity of sewage discharge.

**Paratyphoid Fevers.** Paratyphoid is an acute specific fever caused by a microbe. Three varieties of it are known and are called paratyphoid A, B and C. It produces the same kind of symptoms as typhoid, usually in a milder form and of a shorter duration. It occurs independently of typhoid, but occasionally both infections take place simultaneously. The incubation period varies between 3 and 15 days.

The onset of the disease is more sudden than in typhoid with chills, headache, pain in the abdomen. The temperature reaches its maximum in 24 hours and remains there with a little daily remission for about 2 or 3 weeks, then it begins to fall and reaches the normal level in 2 or 3 days. The "rose spots" are present in paratyphoid A only. Compli-

cations are less frequent than in typhoid. Paratyphoid C is very mild and lasts for a week or so. The treatment for these is carried out on the same lines as for typhoid.

**Typhus Fever** or Spotted Fever. It is an acute infectious fever whose microbe is conveyed from man to man by the louse. It is present in an endemic form in many countries in Eastern and South-eastern Europe, Siberia, Northern China, Iraq, Iran and North Africa. Under favourable conditions, viz., overcrowding, insanitary habits, etc., it breaks out in an epidemic form. It is most prevalent during winter on account of crowding, wearing of thick underwear in which the louse thrives and less frequent baths. In hot weather the disease practically disappears. The incubation period is usually a fortnight.

The onset is sudden accompanied with chills, fever and intense prostration which sends the patient to bed. Headache, giddiness, pains in the back and limbs and loss of appetite are present. The temperature reaches 103 or 104 in a short time and remains high till the end of the disease when it rapidly comes down to normal. In fatal cases it rises to a very high level. In some cases in spite of the fall of temperature the general condition deteriorates and the patient dies in a comatose condition. A disagreeable smell is given off from the skin of the patient which resembles the smell of mice or rotten straw.

The eruption of typhus appears on the third to the seventh day, it is found on the trunk and the extremities, seldom on the face, in the shape of small round or oval slightly raised spots varying in size from a pin's head to a pea. In the beginning they are pink and fade on pressure but later they are not affected by pressure. There may be a dark mottling of the skin which obscures the rash, but this mottling soon disappears leaving the rash clearly visible. All symptoms are aggravated on the appearance of the rash, the prostration is more pronounced and the delirium is succeeded by a comatose condition. In fatal cases death takes place between the twelfth and the twentieth day. Some cases present a peculiar state of coma known as "coma vigil" a day or two before death, in which the patient lies listless and insensible to his surroundings with staring eyes, partly open mouth, pale and expressionless face and breathing scarcely perceptible. In cases terminating favourably, improvement is noticeable about the beginning of the third week when the patient becomes quieter, the temperature goes down slowly, the skin becomes moist, the pulse becomes slower and the flush on the face disappears. In some children the disease runs a very mild course, the prostration and delirium are absent and the duration is shorter. The mortality rate varies in different epidemics, the younger the patient the better the chances of recovery.

**TREATMENT.** The chances of recovery of a patient depend to a very great extent on proper nursing and general care which he receives. All possible sources of physical exhaustion are to be eliminated and his strength maintained until the disease runs its natural course. Care should be taken to prevent the formation of bed sores (*q.v.* page 31, Part I). The first thing to do, not only in his interest, but in that of those that come in contact with him, is to delouse him and boil his clothes. Liquids

should be given very freely to drink. Enemas may be given to relieve constipation and soft well sterilized rubber catheter used for retention of urine. The diet should consist of soft solids or liquids according to the patient's ability to masticate. Nutrient enemas will have to be given in case the patient is comatose. For high fever cold bath, wet pack or cold sponging will be necessary. Diaphoretics, sedatives and other depressants are not advisable for prolonged use. For sleeplessness an occasional dose of  $\frac{1}{2}$  to 1 fluid drachm of paraldehyde, 5 to 7 grains of veronal by the mouth, or  $\frac{1}{200}$  to  $\frac{1}{120}$  of a grain of hyoscine hydrobromide subcutaneously is given. Urotropin is given intravenously in the treatment of typhus and although it is reported favourably it does not act as a specific remedy. During an epidemic or residence in an endemic area all precautions should be taken to prevent infestation by lice. Recently a new antibiotic drug, called terramycin, obtained from a fungus, has been used in the treatment of typhus fever with success.

**Vaccinia** or Vaccination. Vaccinia is an infectious disease of bovine animals communicable to human beings. It is intentionally communicated to man as a protection against smallpox. It gives rise to a local reaction and some general disturbance. Vaccinia was, at one time, very prevalent in England among the dairy folk and there was a belief current among them that those who had suffered from it were immune to smallpox, but no attention was paid to it by medical men who must have been aware of the belief. Dr. Jenner was the first physician who investigated the matter scientifically. At a very young age when he was apprenticed to a surgeon, he one day heard a young peasant girl say that as she had cowpox she was immune to smallpox. This statement set him thinking and he made many experiments and observations in connection with this and he was convinced that inoculation with cowpox was the surest method of protection against smallpox. The detailed report submitted by him to the Royal Society was rejected by that body and it remained unpublished for many years until Jenner himself published it. This was the beginning of the great movement of vaccination which is now practised all over the world and has been the means of saving millions of human lives and much suffering. In old days vaccination was performed by direct arm-to-arm method and the lymph from the vaccinia produced in human beings was used; as this was not a safe method and likely to convey dangerous diseases it has been abandoned and now lymph obtained from the vaccinia in the cow is universally used. All precautions are taken to collect the lymph under aseptic conditions and it is rendered safe for inoculation. It is manufactured at special centres and sent out in sealed glass tubes to distant places.

From time immemorial protective inoculation against smallpox by direct method was practised in many eastern countries, particularly in China, Iran, Arabia, Turkey and to some extent in India. This was done by producing smallpox in a mild form in the person inoculated. Fresh scabs from a smallpox patient were collected and ground into a paste with a little water and a small quantity of this was rubbed on

the scarified skin. This brings on a mild attack of smallpox and makes the patient immune for life. In some parts of Arabia this method is still practised. Lady Mary Wortley Montague, the wife of the British Ambassador in Turkey, who had seen this direct method of protective inoculation in Constantinople, introduced it in England in 1721 by getting all her children inoculated in this way. After this many experiments were made on condemned criminals and the efficacy of this method of protection against smallpox was definitely established. It was practised in all European countries until Jenner's investigation produced a safer and easier method.

Vaccination is now performed in practically every country in the world as a protective measure against smallpox. All persons, who have not been previously successfully vaccinated or those who have not suffered from the disease, are susceptible to it. In very rare cases it fails to take even after repeated attempts on account of natural immunity, but such immunity is very rare and the failure, in a large majority of cases, is due either to faulty technique or old and inactive lymph. The number of such cases is much reduced if the attempt is repeated with fresh lymph. No person should be considered to have natural immunity until vaccination has been repeated at least three times with fresh lymph.

The age at which the primary vaccination should be done varies under different circumstances. It should not be performed for the first four weeks of life as it is apt to produce severe local and general reactions at that age which might prove fatal. The suitable age for vaccination is the fourth or the fifth month or a little earlier if there is an epidemic of smallpox. Children suffering from an extensive skin disease, malnutrition or debility should not be vaccinated until normal health is restored. The site most commonly selected is the outer and upper part of the left arm or, in grown up persons, the upper and front part of the forearm. In female children the upper and outer part of the leg or the outer surface of the thigh is selected so as not to have the scar on an exposed part of the body. The site selected is washed with soap and warm water and then rinsed with some water that has been recently boiled. Antiseptics should not be applied as they render the vaccine inactive. Rectified spirit may be used if the part is very dirty after it is well washed; the alcohol is removed by washing with boiled water before vaccination.

A vaccination lancet, which has been kept in boiling water for at least ten minutes, is used to scarify the skin, only a few superficial scratches being made without producing any bleeding, but if there is much blood it should be cleaned with a piece of clean gauze or cotton wool before the lymph is applied. A rotary type of vaccinating lancet is now used and is very convenient and less likely to draw blood. This consists of a handle at one end of which there is a small scoop to take a measured quantity of the lymph, while the other end consists of a small circular piece from which project four pointed projections which are meant for scarifying the skin. After it is boiled for ten minutes and allowed to get cool the circular end with sharp projections is pressed

against the skin with gentle pressure and the handle rotated three or four times. The scoop at the other end is used to carry a small quantity of the lymph which is gently rubbed on the scarified skin with the back of the scoop. Two or three such insertions are made leaving a short space between them. The part should not be covered until the lymph is dry. As a rule no dressing is required but in children a sterile pad of gauze is lightly applied for three days so as to prevent the child scratching the part and infecting it with septic matter.

No serious complications are likely to occur after vaccination if all the precautions described above are strictly observed. In some cases of primary vaccination the lymphatic glands nearest the site vaccinated get enlarged and painful for a few days, but the trouble is not serious and subsides without any treatment. A generalised skin eruption may occur in some rare cases on account of an allergic condition of the child to foreign proteins; it is not serious and does not require any treatment.

In some cases within a short time after vaccination a small red area appears at the site of inoculation which subsides within 24 hours. Apart from this there is no other reaction for the first three days. On the fourth day a small red slightly raised spot makes its appearance which grows in size. On the sixth day this is converted into a soft vesicle which continues to increase in size for the next 3 days and shows a small depression in the centre with an inflamed area of skin surrounding it, the contents, at the same time become purulent. With the formation of pus some general symptoms, such as fever, nausea, vomiting, etc., make their appearance which abate after three days. The inflammation of the skin subsides and the pustules dry up and a crust forms on the surface which remains adherent for a week and drops off between the eighteenth and the twenty-first day.

**Revaccination.** The protection afforded by vaccination lasts for 5 to 7 years, after that it gradually wears out, it is therefore advisable to get the child revaccinated at the age of seven or earlier if there is an epidemic. The reaction after revaccination, both local and general, is much milder or absent in some cases. If revaccination is performed before the immunity conferred by the primary vaccination is exhausted, the symptoms are very mild or absent and the local reaction does not take place or is much modified. If it is delayed too long the symptoms of revaccination resemble those produced by primary vaccination. Ordinarily revaccination should be done every five years after the seventh year; two such revaccinations being sufficient to confer complete immunity for life. It is safer to be revaccinated during an epidemic of smallpox if successful vaccination has not been done during the previous three years.

**Anti-vaccinationists.** Ever since the introduction of vaccination there have been some persons who seem to think that they know everything about sanitary and medical matters and who have been strong opponents of this most effective and simple measure against this terrible disease which, not only used to kill millions of people, but used to disfigure and blind many others. Their argument is that the decline in smallpox is due to sanitary measures in general and not due to vaccination. But

all the sanitary measures have not abolished the prevalence of other infectious diseases, such as scarlet fever, diphtheria, whooping cough, measles, etc. It has often been observed that nurses, sick attendants and others who work in infectious diseases hospitals or come in contact with patients and who are protected by vaccination do not get the disease, while those not protected get the disease, both working under the same conditions. The most convincing evidence of the efficacy of vaccination as a protective measure against smallpox is provided by the statistics of isolation hospitals where large numbers of smallpox cases are treated. It has been observed that more severe and fatal cases occur among those who have not been vaccinated at all or not revaccinated within 5 years, although all patients come from the same class of people living under the same conditions as regards sanitation, food, etc. These anti-vaccinationists, by spreading these fallacious arguments and preaching against vaccination are doing a great disservice to humanity. Fortunately their number is small and their followers not many.

**Whooping Cough.** It is an acute infectious disease caused by a micro-organism the nature of which is not yet known. The disease derives its name, as everyone knows, from a peculiar crowing noise produced by the patient during the paroxysm. It is a disease of childhood, most of the cases occurring between the ages of two and ten; adults and old persons rarely suffer from it, but those who had not had it in childhood are liable to get it in adult life. It is prevalent in all the countries of the world but is less severe and less fatal in tropical countries. The infection is spread in fine droplets produced during coughing, sneezing or speaking. The incubation period is from 5 to 15 days. In the new-born and very young children it is very short.

The course of the disease is divided into three stages: (1) the preliminary or catarrhal, (2) the paroxysmal, and (3) the defervescence or decline. The catarrhal stage begins like an attack of cold or mild bronchitis with some fever, running from the nose and cough. This lasts for a week or ten days and excites no suspicion of the disease. During the next stage the cough becomes more violent, more frequent, longer in duration and consists of short explosions during which no air enters the lungs. The child looks distressed, the face becomes blue, eyes prominent and injected, the tongue protruding from the mouth and the face is covered with perspiration, but just when the child seems to be on the verge of suffocation the cough ceases, a deep inspiration is taken and the air rushes through the larynx producing the characteristic whooping sound. This is often followed by vomiting, especially if the paroxysm occurs after food. In severe cases the paroxysms are frequent and two or three occur together. Ordinarily this stage lasts for 2 or 3 weeks but may be prolonged to as many months.

During the third stage the paroxysms become less frequent and milder in character and stop after a fortnight but may continue much longer. One attack gives immunity for life and a second attack is very rare. Broncho-pneumonia is a serious complication in infants and young children, mostly during winter months. In severe attacks vomiting is very frequent so that the patient is unable to retain any food and in

consequence loses weight and becomes prostrated. Bleeding may take place from the nose, mouth or under the conjunctiva.

**TREATMENT.** The patient is kept in a well ventilated room, but need not be confined to bed unless he has fever. He should be protected against cold by adequate clothing. Infants and children in poor health should be kept indoors, others allowed to play in the garden, but should not associate with other children who are not protected by a previous attack, as the paroxysms are less frequent in fresh air. Physical exertion and mental excitement bring on paroxysms and should be avoided. Food should be light and nourishing and should be given frequently in small quantities at a time. The tendency to vomiting is less if liquids are not given with meals. If vomiting has taken place after a meal a fresh one should be given after ten minutes and the patient kept in bed for some time.

Many drugs and preparations have been recommended and advertised but so far no specific has been found. In India uncooked garlic is given internally as a specific for whooping cough, which is found to reduce the severity of the paroxysms. One to three cloves from a fresh corm according to the age of the patient are chopped fine and given with bread, butter and jam four times a day. Preparations made from garlic are sold under trade names for the treatment of whooping cough but the fresh garlic seems to act better. If the paroxysms are frequent at night and disturb sleep sedative drugs may be given thrice a day (No. 105). Anti-biotic drugs are tried with encouraging results.

**Yaws** or Frambesia. It is a chronic infectious disease communicated by direct contact and caused by a spiral micro-organism. It is highly contagious, a contact with the discharge from the sore is enough to transmit the disease provided there is a wound or even a scratch on the skin. Flies are also capable of carrying the infection to healthy persons. The disease is found in the West Indies, Pacific Islands, Malaya, the East Indies, Ceylon and Africa. The incubation period is from 3 to 4 weeks.

The course taken by the disease is divided into primary, secondary and tertiary. It first appears as a small round warty growth at the site of infection which is mostly on the lower extremity but may be on any other exposed part of the body. It is painless unless pressed, has a tendency to grow and exudes a thin purulent discharge. With the appearance of this primary lesion, which is known as *mother yaw*, there is some general disturbance of health. Rheumatic pain in the bones, headache, slight fever and the enlargement of the lymphatic glands in the vicinity of the sore are some of the symptoms. There is usually one such primary sore, but there may be more than one if more than one site is simultaneously infected. In course of time, if no treatment is taken, the disease passes into the secondary stage, during which, what is known as *daughter yaws* appear on different parts of the body. In the beginning they appear around the primary lesion which are known as *mother and daughter yaws*. After a time they are seen in different parts of the body in crops of small nodules varying in size from a pin's head to a golf ball. In time they burst on the top and

get covered with a yellowish crust which drops off leaving a discoloured area of skin. These secondary lesions appear about three months after the primary one.

Tertiary lesions, which consist of extensive ulcerations of the skin and destruction of bones, appear some months later. The skin of the hands and feet becomes thick and fissured, the nails become brittle and fall off and the cartilage and bones of the nose are destroyed. The disease, if not treated, drags on for months or years and ultimately kills the patient, but if taken in hand early and given the specific treatment it disappears completely leaving no ill effects behind.

**TREATMENT.** Measures to promote general health by nourishing food, tonics and hygienic conditions as in other chronic diseases are indicated. The specific treatment, which has a magical effect in every stage of the disease, consists in administering intravenously one of the organic arsenical compounds sold under different trade names. Two or at the most three injections are necessary to eradicate the disease.

**Yellow Fever.** It is an acute infectious disease caused by a minute micro-organism which grows in the blood of patients suffering from it. It is transmitted to healthy persons through the bite of a mosquito known as *Stegomyia fasciata* (*Aedes Aegypti*). The infection is not carried by direct contact with the patient nor by the articles used by him. The disease is endemic in some parts of South America, in West Indies and West Africa where it occasionally breaks out in an epidemic form. It was very prevalent at one time in Panama Canal Zone but has been completely wiped out by measures directed against the mosquito. On account of the universal prevalence of this kind of mosquito in India and the ease with which an infected mosquito can be carried long distances from the endemic area by aeroplanes, there is a real danger of the disease being imported into India. However measures are taken by health authorities at airports against the importation of live mosquitoes. In contrast to malaria, yellow fever is more prevalent in urban than in rural areas. One attack of the disease gives immunity for life against another attack. The incubation period is from 3 to 6 days or may be prolonged to 12.

The onset is sudden with chills and the same general disturbance of health as in other acute infectious diseases. The fever is not high in the beginning, being 102 or so. The first stage with these general symptoms lasts for about 3 days and is followed by the "period of calm" in which there is some yellow discoloration of the skin and conjunctivae with the abatement of the symptoms. This relief of early symptoms gives a false idea that the attack is a mild one, as the remission does not last long and may be for a few hours only and is followed by the third stage. The temperature rises again, vomiting sets in, the urine becomes scanty and contains albumin or is suppressed, jaundice becomes deeper, the eyes are more blood-shot, there is great thirst, the vomitted matter and the stools contain blood and bleeding from the nose and gums takes place. In cases terminating fatally the urine is completely suppressed and coma sets in before the end. Death usually takes place before the eighth day. In cases which are going to recover

the first favourable sign is the increase in the quantity of urine and decrease in the amount of albumin in it. The temperature becomes normal in 2 days and the convalescence progresses fairly rapidly without any complications.

**TREATMENT.** The patient is put to bed immediately under a mosquito curtain and not allowed to get up until convalescence is well established. In the beginning a saline purgative or 3 grains of calomel are given at bedtime followed the next morning by a small dose of magnesium sulphate. The diet should be soft or liquid and plenty of liquids should be given to increase the flow of urine. For persistent vomiting very small quantities of iced liquids should be given at frequent intervals and mustard plaster applied to the pit of the stomach. Iced whey, barley water with glucose, weak tea, etc., should be given until the stomach is able to retain them. In very obstinate vomiting when the system is depleted of fluids it is necessary to replace these by intravenous injection of saline solution or saline per rectum. Serum is used in the treatment of yellow fever but to be of any use it should be administered at a very early stage.

## CHAPTER V

### VENEREAL DISEASES

Venereal diseases are those which are usually transmitted during sexual intercourse. There are three different diseases under this head, viz., *chancroid*, i.e., non-syphilitic sore, *gonorrhoea* and *syphilis*. Two or all three may be communicated at the same time during sexual contact.

**Chancroid.** It is also known as soft sore in contrast to syphilitic sore which is hard to the touch. It makes its appearance 24 to 72 hours after infection, as a small pustule or an abrasion on the skin of the genitals which soon breaks down and forms a sore. If it is also infected with pyogenic microbes it tends to spread destroying a large area of skin. It is soft to the touch when it is pressed between fingers, but if neglected and allowed to remain without proper treatment it may become somewhat hard and resemble syphilitic sore. There may be more than one such sore present. It is caused by a specific microbe, which, unlike syphilitic virus, remains confined to the site of infection and to the nearest lymphatic glands in the groin where a bubo, known as venereal bubo, may form. This breaks down and forms a deep sore which takes a long time to heal. Sometimes the site of the chancroid is infected with syphilitic virus at the same time, in which case the characteristics of the syphilitic sore are not noticeable and syphilitic infection may not be recognised until its secondary manifestations have made their appearance and widespread generalized infection of the whole system has taken place making its treatment more difficult, prolonged and uncertain. It is, therefore, necessary in every case of venereal sore to have an early microscopic examination made by a pathologist to find out if syphilitic infection is also present, as it is the more serious of the two diseases and calls for prompt and energetic treatment. The examination has to be repeated two or three times before the negative finding is confirmed. During this period no antiseptics are used on the sore as they cause the syphilitic micro-organisms to disappear rapidly from the surface though they thrive in the body, the sore being washed with boiled saline solution and covered with clean dressings.

The treatment of chancroid, after the microscopic examination has been completed, is to dress it with some antiseptic lotion. If the sore does not react to treatment and shows a tendency to spread it is touched with pure carbolic acid and dressed with precipitated sulphur. When situated on the inner surface of the prepuce it may produce phimosis or paraphimosis (*q.v.*) requiring surgical treatment. The preventive treatment is the same as for syphilis.

**Gonorrhoea.** It is a communicable disease caused by a micro-organism known as gonococcus which invades the genito-urinary tract and under favourable conditions may spread to other parts and organs of the body. It produces a severe suppurative inflammation. The

infection is conveyed from person to person during the sexual act. It may attack other sites, such as conjunctiva, nasal and rectal mucous membranes, and can be conveyed through infected fingers, linen, towels, etc. It is liable to get into the general circulation and cause serious mischief in the heart, joints, etc. The period of incubation varies between 3 and 8 days but usually it is 6 during which there are no symptoms.

The attack is ushered in by a little itching at the end of the urethra soon followed by burning and scalding during micturition. At first a little thin muco-purulent discharge appears, but it soon becomes purulent and consists of thick yellow pus. The act of micturition becomes so painful that the patient holds the urine till the bladder is over-distended. There may be some fever and a little disturbance of general health. The acute symptoms continue for about ten days or so then they subside gradually but the discharge continues for six to eight weeks after which it becomes thin and diminishes in quantity and may be present only in the morning.

If proper treatment is not taken, sometimes in spite of the treatment, the disease becomes chronic and troublesome. The patient is capable of transmitting the disease as long as there is the slightest discharge and until a microscopic examination of the deposit in the urine or the pus, obtained after a provocative injection of an irritant solution into the urethra, is negative. Much physical exertion during the acute stage, use of alcohol, sexual indulgence, want of proper precautions as regards food and poor health favour the spread of infection to deeper parts of the urethra and the bladder in which case pain and difficulty of micturition are increased and the condition apt to become chronic.

Many complications are liable to occur in the course of the disease, such as abscess round the urethra, inflammation and suppuration of the prostate, inflammation of the urinary bladder and testis, troublesome arthritis and synovitis, gonorrhoeal pyaemia, endocarditis and stricture of the urethra. Fortunately, since the introduction of sulpha drugs and penicillin in the treatment of this disease all these can be avoided, provided early treatment is undertaken. The disease is cut short by the use of these drugs. Penicillin, though very efficacious and very rapid in action, is not advisably used for gonorrhoea, as it may mask a concomitant infection of syphilis which has a much longer incubation period and which requires a much longer course of treatment. If used for the cure of gonorrhoea it prolongs the time for the manifestation of syphilis or prevents the appearance of the primary sore and the patient remains unaware of the dangerous infection of syphilis until the virus invades the whole system which requires prolonged and tedious courses of treatment which may not completely eradicate the disease. For this reason the sulpha drugs, which are not quite free from certain risks and which sometimes fail to bring about a rapid cure, are used as these have no effect on syphilitic infection. Two of these are used, viz., sulphapyridine and sulphathiazole, which are sold under different trade names. The latter is now more commonly used being less liable to produce unpleasant symptoms. A large

initial dose, 2 grammes of the former or 3 to 4 of the latter, is given at 8 or 9 o'clock in the morning and followed up every four hours regularly during the twenty-four hours by 1 gramme (15 grains) so as to maintain a certain amount of concentration in the blood. The discharge stops in about three days but the treatment has to be continued for a week longer otherwise a relapse is likely to occur. If the drug is taken in smaller doses or if the proper concentration is not maintained, the micro-organisms get immune to it and do not respond to the treatment afterwards. During the treatment with these drugs it is necessary to take a large quantity of liquids internally so as to flush the kidneys as these drugs have a tendency to be precipitated in the minute tubes in the kidneys and block them causing serious trouble. Some persons are very susceptible to these drugs and get toxic symptoms, viz., fever, vomiting, blood or blood pigment in the urine, etc. In such cases the drug is stopped.

In the early stages when the symptoms are acute, rest in bed, bland non-stimulating diet free from spices, plenty of liquids internally, avoidance of alcohol in any form and the administration of alkalies (No. 51) are indicated. Chronic gonorrhoea, known as gleet, is a very troublesome complaint and may require urethral injections and cauterization of ulcerated or inflamed foci in the urethra with special instruments after urethroscopic examination. The infection might spread to the prostate gland and cause chronic inflammation or supuration which lasts a long time. Stricture of the urethra is another serious complication which is likely to occur in chronic cases requiring early surgical treatment. Fortunately, under modern treatment these complications can be avoided.

**Syphilis.** Syphilis is a communicable disease caused by a spiral-shaped micro-organism known as *spirochaeta pallida*. It is transmitted from a person to person by sexual contact, kissing, drinking from an infected vessel or smoking a pipe used by a patient or by contact with blood or discharge from a patient. The micro-organisms gain entrance into the body through a breach of surface which may be a minute microscopic abrasion on the skin or mucous membrane. When thus acquired it is called acquired syphilis in contrast to inherited or congenital when it is transmitted to the new-born by one or both the parents who may be suffering from it.

The usual incubation period is from two to three weeks, but it may be as short as ten days or may be prolonged to six weeks. If penicillin has been administered for a concomitant infection of gonorrhoea, or if the abrasion on the skin through which the virus has entered, has been treated with antiseptics, the incubation period is much prolonged. The first manifestation of the disease is the appearance of a sore or chancre at the site of infection, which has certain well-marked characteristics which are helpful in diagnosing the disease at an early stage. It may commence as a small red spot or a small papule which grows in size and forms an ulcer with a well-defined raised margin and a hard base which feels like a button. The lymphatic glands draining the lymph from the affected area become enlarged and hard but are

painless unless septic infection of the sore has taken place. In the female the sore may be present on the external genitals or inside the vagina. The extra-genital sore is found on the lips, tongue, cheek, female breast or fingers. In congenital syphilis the primary sore is absent and the child is born with general infection.

In every case of sore it is extremely important to have a diagnosis made at a very early stage and before the virus has time to spread in the system, as, then the treatment necessary for a complete cure is short, more certain and less troublesome. The virus soon invades the nervous system in which case the chances of a thorough cure are remote. Moreover, groups of active micro-organisms get lodged in places inaccessible to drugs where they remain alive in spite of specific treatment and cause recrudescence of symptoms. Once the virus is well-established in the body there is no part or organ that is not likely to be invaded. For the purpose of an early diagnosis a microscopic examination of the lymph squeezed out from the primary sore is made. This is done before an antiseptic is used on the sore, as the effect of using an antiseptic lotion is to cause the disappearance of the micro-organisms from the superficial part and the result of the examination may be negative in spite of infection.

For some time after the development of the sore there are no other outward signs of the disease. The sore heals readily under specific treatment, but the virus in the circulation requires more rigorous and persistent treatment for its complete eradication. If no specific treatment is taken the sore persists for a long time and even after healing leaves a hard scar which is liable to ulcerate again. The symptoms of the secondary stage become noticeable after three to six weeks, in the skin, mucous membrane and the lymphatic glands of the whole body. The rash on the skin is of a mixed type and varies in size and colour. Some of the spots are raised like papules, while others are flush with the surface. Small white patches appear on the mucous membrane of the mouth, throat, palate and tonsils which ulcerate and form small shallow ulcers. The discharge from these is highly infectious. As the disease advances the skin eruptions become more numerous and some form ulcers.

Near the anus they take the form of wart-like growths which are called condylomata, and like other growths about the anus they are popularly diagnosed as piles, but that is a different condition altogether. Some loss of hair, disturbance of general health, slight fever, headache, pain in the limbs and inflammation of the iris with pain and hypersensitiveness to light and even loss of vision are some of the symptoms during this stage.

A very reliable test for detecting the presence of the virus of syphilis in the body, even when there are no outward signs of it, or before these have developed, is known as Wassermann's test. It gives a positive reaction after about four weeks from the time of infection. The earlier and stronger the reaction the more virulent is the infection. For performing this test a small quantity of serum obtained from a little blood drawn from the patient's vein or from a blister, or a little

cerebro-spinal fluid withdrawn from the spine is used. The test is very reliable and is the only criterion for a cure or the absence of syphilitic virus in the body. The test is carried out after a course of treatment and on its result depends as to whether the treatment has to be repeated. The test is repeated every six months even when the result is negative, for two or three years, as incomplete treatment may produce a negative reaction for some months and if the treatment is discontinued on the assurance of a single test, the remote and dangerous affections of the brain and other parts of the nervous system, blood vessels and bones may develop in the meantime with disastrous results. It is therefore necessary to have six-monthly blood examination for two or three years and after that once every year for five years. There are other tests for syphilis, such as Kahn's, Noguchi's, etc., which are done at the same time as Wassermann's test so as to make sure of the result.

After the secondary stage, which lasts for an indefinite period and which can be shortened by treatment, there may be no outward symptoms to remind the patient that he is suffering from a dangerous disease and he may believe himself cured, but unfortunately such is not the case. During this intermediate or late secondary stage he might have, by way of reminders, some skin rash which might ulcerate. These ulcers take a long time to heal and leave unsightly scars. Inflammatory changes take place in the arteries which become hard and brittle and become liable to be ruptured, particularly in the brain causing apoplexy and paralysis.

The tertiary or the third stage may appear at any time after six months or may take years, sometimes twenty, to do so. Tertiary lesions are very destructive and not easily amenable to treatment and may affect any part or organ in the body including the brain and the rest of the nervous system. These appear in patients who have been negligent and have discontinued treatment before the blood test has become permanently negative.

The inflammatory changes in the tissues and organs during the tertiary stage are characterized by the formation of localized or diffused formation of much fibrous tissue. The localized form varies in size and is known as gumma which may be present anywhere in the body, skin, bones, brain, liver, lungs, etc. It softens in the centre and breaks down forming large unsightly ulcers which do not heal readily and have a tendency to spread and cause much destruction of tissues and when they heal they leave very ugly scars. The destruction of the nasal bones produces the flattening of the bridge of the nose and the involvement of the hard palate causes a perforation which communicates with the nasal and oral cavities. The involvement of the brain causes softening or general paralysis of the insane (*q.v.*).

The preventive treatment consists in avoiding exposure to infection, not only from sexual contact but from oral or nasal discharges of syphilitic patients. Nursing a child suffering from congenital syphilis may convey the disease through the nipple. If exposure has taken place the part should be thoroughly washed with soap and warm water and

soaked in corrosive sublimate lotion (No. 42-2). After this 50% calomel ointment is well rubbed on the part and allowed to remain for 24 hours. This is done as soon after the exposure as possible as the virus quickly enters the circulation. If this is properly done within twelve hours the virus might be destroyed; the longer it is delayed the less chances there are of success.

The modern treatment of syphilis is systematised and much simplified. In old days mercury was the only drug available and though it had beneficial effects on the symptoms, it was slow in action, tedious to take on account of the prolonged period of five years or longer required for a cure and very often its failure to eradicate the disease and ineffectiveness in preventing the late manifestations, particularly of the nervous system, it is therefore replaced by arsenic and bismuth. After hundreds of organic preparations of arsenic were made and tried by Dr. Ehrlich of Germany in collaboration with Dr. Hata of Japan a compound was found which they called 606, being the 606th chemical preparation made and tested by them. This is sold under the trade name of salvarsan. It is administered intravenously and is very rapid in its action, but is difficult to prepare and administer and is apt to produce toxic symptoms. It is therefore replaced by another simpler preparation called neo-salvarsan which is numbered 914. Of late other and less toxic and more efficacious preparations are on the market. Bismuth is another metal found to be specific in the treatment of syphilis and is administered at the same time as arsenic and is given intramuscularly in the form of finely divided metal held in suspension with an oily base once a week. The rapid removal of the outward manifestations of the disease by these drugs gives the patient a false idea of being completely cured and patients ignorant of the real nature of the infection often discontinue the treatment before the disease is eradicated from the system as determined by repeated blood examinations, with very serious consequences in the future. If the treatment with arsenic and bismuth is commenced at a very early stage and before the secondary stage is well established a complete cure may be brought about after two or three courses of treatment. But if the treatment is delayed it may be necessary to continue it for three years or longer. A course lasts for three months and consists of weekly injections of one of the arsenical preparations intravenously and of bismuth intramuscularly in regulated doses. During the period iodide of potassium is administered by the mouth daily so as to prevent the formation of inflammatory thickening in the issues where the microbes are able to lurk for prolonged periods without being affected by the drugs. After the completion of the course no injections are given for three months, after which another course of three months is given followed by rest for three months during which iodide of potassium is continued intermittently. After the completion of the course blood examination is made and if necessary, the treatment is continued until the result of blood examination is permanently negative. If the treatment is discontinued, as is often done by some optimistic patients, before the virus is completely eradicated, which can only be determined by repeated

blood tests, the late manifestations of the disease are very liable to appear in the central nervous system in the shape of general paralysis of the insane, locomotor ataxy, apoplexy, etc.

The treatment of syphilis is likely to be much shortened and simplified in the near future as penicillin is found to have a strong bactericidal effect on the virus of syphilis. It may be possible to cure the disease in a week or fortnight. But it will require prolonged observation to determine whether the effect is permanent and that no late manifestations are likely to appear.

## CHAPTER VI

### SYSTEMIC DISEASES

#### DISEASES OF THE BLOOD AND CIRCULATORY SYSTEM

**Anaemia.** The term is applied to a condition of blood in which it is deficient in quantity or quality, or usually in both. There may be a reduction in the number of red blood corpuscles or in the amount of iron in them. It may be primary when it originates in the blood-forming organs, viz., the liver, bone marrow, etc., or secondary when it is caused by an excessive loss of blood from a wound. Pregnant women are liable to suffer from it, as also young growing girls who live under unhygienic conditions; in the latter case it is known as chlorosis. A chronic and severe type of primary anaemia, which is fatal, is known as pernicious anaemia.

The symptoms and treatment of acute anaemia from loss of blood is described under bleeding. In chronic cases the skin is pale, tongue and conjunctivae white, the patient is weak, has palpitation, shortness of breath, giddiness and a tendency to faint. There is usually some swelling and puffiness about the ankles. Patients with swollen feet, palpitation and breathlessness should rest in bed as much as possible and protect themselves against cold. Less severe cases may take light exercise in the open air without getting tired. Very severe cases require transfusion of blood. The diet should be easily digestible and should include green vegetables, fresh fruit, red meat, liver, whole cereals and milk. As for drugs, iron is the specific remedy for anaemia and is given by the mouth or injection. Five grains of Bland's pill (No. 125), gradually increased to ten, is given thrice daily after food; it may be combined with nux vomica (No. 126), or a mixture containing iron (No. 77), or iron with arsenic (No. 78) might be given as above. Ampoules containing soluble salts of iron are available for injection.

**Pernicious Anaemia.** It is a chronic disease, of which no cause has been found so far; it progresses steadily with occasional intermissions and ends in death. It affects the nervous system and gastro-intestinal tract. It is a disease of middle life and is rarely seen before 30 and after 60. The gastric secretion is deficient in hydrochloric acid in this disease. The onset is insidious and the patient is unable to fix a date when the earliest symptoms made their appearance. These are weakness, languor and a dark yellowish pallor of the skin; the last is the first thing to attract the attention of the patient's friends. Loss of appetite, indigestion, diarrhoea, soreness of the tongue, tingling and numbness in the limbs, palpitation, shortness of breath and swelling of the feet make their appearance as the disease develops. Bleeding from the gums and nose, and in women, from the womb may take place, or in the retina which damages the eyesight. There may be one or more remissions in the course of the disease when the patient looks and feels better, but the condition of the blood remains abnormal all the time.

The outlook for the patient is always very grave, and before the introduction of liver and stomach extracts, and vitamin B<sub>12</sub>, which is the anti-pernicious anaemia factor in liver, death took place within a year, but now with the administration of these preparations life can be prolonged for years. Rest in bed is essential when the symptoms are pronounced, but when the condition permits, the patient may walk in the open or go out for a drive. The diet should be the same as for ordinary anaemia. It should contain quarter to half a pound of fresh sheep's liver lightly cooked. Kidneys might occasionally be substituted for liver. Raw liver juice, extracted with a little salt and flavoured with some essence, is also beneficial. Preparations made from the stomach of animals are also given by the mouth with some hydrochloric acid (No. 50). Liver extract ready for injection intramuscularly is available in glass capsules. In very severe cases transfusion of human blood is given, but unfortunately, the benefit derived from it is temporary, and frequent transfusions are necessary. Vitamin B<sub>12</sub>, recently introduced for the treatment of this disease, has been found to be very effective in controlling the progress of the symptoms.

**Leukaemia.** In this disease a very large number of white blood corpuscles are present in the blood due to some change in the bone marrow, spleen and lymphatic glands where these cells are formed. It is a disease of the middle life and is more common in the male than the female. Sometimes more than one member of the same family is attacked, but it is not hereditary. The onset is gradual with weakness, palpitation, shortness of breath, loss of weight, giddiness, gastro-intestinal disturbances and pallor; the onset may be rapid. One of the first symptoms noticed by the patient is the enlargement of the spleen with a sense of weight in the abdomen. Bleeding occurs from the nose, stomach, gums, bowels and under the skin; it may take place in the brain and cause death. High temperature is present in acute cases and towards the end in chronic ones. All the lymphatic glands are enlarged when the disease is fully developed. In spite of occasional temporary remissions, the disease progresses steadily and ends fatally within three years or much earlier in acute cases.

There is no specific remedy for the disease, but much could be done to prolong life and make the patient comfortable. Internally arsenic is given in increasing doses, or as much as could be tolerated without producing gastric disturbance. Fowler's solution (solution of arsenic) in 3 minim doses in an ounce of water is given thrice a day after meals, and the dose gradually increased till the maximum of 8 minims is reached. Arsenic is given combined with iron (No. 78) when anaemia is present. Soluble preparations of arsenic are also used for intramuscular injection. Benzol is also administered internally mixed with a little olive oil, but it is irritating to the kidneys; to start with 2 to 3 minims are given and increased gradually to 8. The diet to be the same as for anaemia. In some cases the exposure of the spleen to X-rays has been found to be beneficial.

**Hodgkin's Disease.** It is a chronic disease characterized by progressive enlargement of all the lymphatic glands and the spleen, accompanied

with fever, anaemia and weakness. It occurs mostly between the ages of 20 and 40 and rarely in younger or older persons. It is less common in India than Europe or America. The onset is insidious and the first thing noticed by the patient is the enlargement of the glands on one side of the neck followed by those on the other, and later by all the glands in the body. The spleen can be felt below the margin of the ribs on the left side. The patient gradually loses flesh and strength and becomes pale. Low irregular type of fever is present and continues for days alternating with feverless periods. Dark spots appear on the skin with troublesome itching. Great weakness, severe anaemia and bleeding from mucous membranes develop towards the end which comes within two years if no treatment is taken, but life can be prolonged with proper treatment for several years.

There is no specific cure for the disease. Exposure to X-rays or radium reduces the size of the glands and spleen, but has little or no effect on the course of the disease. Arsenic in increasing doses, as recommended for leukaemia, mitigates the severity of the symptoms. Tonics, nourishing diet and as much rest as possible are necessary for maintaining the health.

**Purpura.** It is a disease in which there is spontaneous bleeding in the skin, mucous membranes and internal organs which produces small spots varying in size from a pin-point to larger areas. These are brownish red in colour and do not disappear on pressure, and undergo the same changes of colour in course of time as a bruise before disappearing, while fresh ones keep appearing. In some acute infectious diseases, such as plague, typhus, smallpox, etc., such spots are found, but purpura is a primary disease. It is more common in children and young persons.

In mild cases there is no constitutional disturbance except a little fever, pain in the limbs and diarrhoea. In more severe cases, which commence in the same way as mild ones, there are large patches of bleeding in the skin and mucous membranes, and bleeding from the nose, gums, bowels, bladder and uterus. In mild cases the bleeding gradually stops and the patient soon recovers, but chronic cases last for years and end in death.

Patients suffering from purpura should take as much rest as possible, and severe cases should remain in bed and have as much light and fresh air as possible. The diet to be the same as for anaemia. Mild cases get well without any other treatment or medication. Severe bleeding from the nose, gums, womb, etc., can be checked by hypodermic injection of about 5 minims of adrenalin solution, but its effect is temporary. The oral administration of 5 minims of oil of turpentine (medicinal) by the mouth also stops the bleeding; it is given in gelatin capsules. It acts as a strong irritant to the kidneys, it is therefore unsuitable for persons who have kidney disease. Excessive bleeding requires transfusion of blood, but its beneficial effect lasts for a week or so, it is therefore to be repeated. Iron and arsenic are also given internally as in anaemia.

**Haemophilia.** It is an inherited condition in which there is a marked tendency to bleed for hours after a trivial injury or even spontaneously.

It occurs in males and is rare in females, though the tendency is inherited through females only. The sons of a "bleeder" very rarely have the disease, but the daughters, though healthy themselves, transmit it to their sons. There are families in whom the disease has continued for generations through the females. It is due to some change in the blood by which its coagulation time is very much prolonged. Normally the bleeding from a cut surface stops spontaneously, provided no large vessel is cut, by the clotting of the blood which plugs the cut ends of the minute blood vessels, but in haemophilic patients clotting does not take place so the bleeding continues for hours. The tendency becomes manifest, in a large number of cases, after the age of three, though the child is usually in good health.

It tends to be fatal in childhood, however many patients reach adult life when the tendency is diminished. The severity varies in different persons and in the same person at different times. There is no specific remedy for the disease, the treatment, therefore, is preventive. A haemophilic child should be protected against injury, and should not be subjected to any operation unless it is absolutely necessary, and the surgeon should be informed of the tendency and a blood donor should be kept ready, and arrangements made for transfusion in case it is necessary. When bleeding takes place the patient should be kept in bed, and if it is from an exposed surface, firm pressure is applied to it with a clean sterilized swab of gauze soaked in tincture or solution of perchloride of iron. The injection of human or horse serum is useful in controlling the bleeding.

### DISEASES OF THE ARTERIES

**Arteriosclerosis.** This term is applied to thickening, hardening and loss of elasticity of the walls of the arteries which interferes with the circulation of blood in them. Normally, the thickening of the arteries is a slow process which begins after the age of 45, but under certain pathological conditions, such as constant high blood pressure, some acute infectious diseases, chronic toxic conditions, syphilis, gout, diabetes, chronic rheumatism or chronic kidney disease, the process is hastened. Heredity is an important factor and it runs in families in whom younger persons are affected; usually such persons are not long-lived. The symptoms produced by it are due to the rise of blood pressure which occurs as a result of the narrowing of the lumen of the arteries, and they are described under that head.

**Blood Pressure.** By blood pressure is meant the lateral pressure exerted by the blood on the walls of the arteries. It varies in different parts of the arterial system, being greatest in the left ventricle of the heart when it contracts, and lowest in the smallest arterioles. It rises suddenly when the heart contracts and pumps blood into the aorta, and falls when the heart dilates to receive more blood from the lungs; the former pressure is known as systolic and the latter as diastolic. It is measured by a specially constructed instrument called sphygmomanometer, which has a verticle graduated glass tube marked in millimetres

communicating with a small reservoir of mercury which is connected by means of a rubber tube to a hollow rubber band. This band is wrapped round the arm and air forced into it by means of a rubber bulb. The inflation of the band constricts the arm and presses on the artery. The inflation is continued until the pulse at the wrist is obliterated; the height of the column of mercury in the tube, when the pulse stops, shows the systolic pressure. A better method is to listen to the heart sounds at the bend of the elbow with a stethoscope. The air is pumped until the heart sounds cease completely; it is then allowed to escape very gradually through a valve and the height of the column noted when the sound returns which shows the systolic pressure. If the air is further allowed to escape, the sound changes its character and becomes short and sharp then it suddenly becomes soft and inaudible, the column of mercury at this point gives the diastolic pressure.

Normally the pressure varies under different circumstances and at different ages. In infancy the systolic pressure varies between 80 and 95 millimetres, in childhood between 90 and 110 and in adults between 135 and 145. In women it is usually a little lower. The diastolic pressure in children is about 50 and gradually rises to between 80 and 90 in adults. It varies under different conditions of health, exercise, sleep, mental disturbances and after meals. It should be taken when the patient is at rest and in the recumbent position and the arm on a level with the body. The difference between the two pressures in health is between 40 and 50 and is known as pulse pressure.

Low blood pressure is usually found in chronic wasting diseases, after profuse bleeding, in shock, heart disease and in a disease of the suprarenal glands known as Addison's disease. Except in bleeding or shock, low blood pressure, unless it is sudden, is not necessarily a serious condition. High blood pressure is common in old age and in certain diseases; it affects different persons differently. It is more common in males and those in well-to-do circumstances who live in cities and lead a strenuous business or professional life, habitually overfeed themselves, and do not take much outdoor exercise. A slight rise of pressure is common during pregnancy, but if it remains constantly high it is a warning of puerperal convulsions. When it is present without any apparent cause it is called essential hypertension.

The danger from high blood pressures lies in its harmful effects, not only on the heart, but also on the brain, kidneys, eyes, etc., whose blood supply is reduced by the narrowed arteries. The small arteries in the brain which have become brittle are liable to give way and bring on an attack of apoplexy. However, every case does not terminate so unfavourably and long life is compatible provided the action of the heart and kidneys is maintained.

Moderately high blood pressure does not produce any noticeable symptoms and it is often detected in the course of a routine examination for some disease. The earlier symptoms are a vague indisposition and mental deterioration. Later symptoms are loss of appetite, gradual loss of weight, frequent headache, inability to undergo much physical or mental work, cramps, and disturbed sleep. The patient is unable

to concentrate his mind, feels depressed or irritable, and forgets names and recent events. In more advanced cases there may be transient attacks of loss or confusion of speech, giddiness, loss of power in the limbs and mental confusion. These may clear up under treatment or end in apoplexy. In old standing cases the surface arteries, especially those on the temples, stand out as thick hard cords. Death may take place from sudden heart failure.

In every case it is necessary to investigate the cause of the trouble, as without it proper treatment cannot be given. In all cases it is necessary to observe certain general rules as regards diet, exercise, rest and mental condition. The patient should refrain from worrying about his condition, as the pressure can be kept under control with proper care and treatment. Occasional temporary rise in the pressure is of no special significance. Patients who are under-nourished should have a fairly liberal scale of diet containing a limited quantity of red meat with very little fat and spices. For those who are obese or are inclined to put on weight, the diet should be restricted and a gradual reduction in weight aimed at. In every case the intake of protein food should be limited, and if the kidneys are diseased it should be avoided, and milk, vegetables, eggs and fruit should be taken. Complete omission of common salt from the diet is often recommended, but such a diet is unpalatable and is likely to upset digestion, it is therefore not advisable except in cases of kidney disease when the amount of salt in the diet should be reduced. Strong alcoholic drinks, immoderate use of tea, coffee, and tobacco should be avoided. A small quantity of diluted alcohol, if the patient is used to it, may be taken with meals. All sudden muscular efforts, mental excitement, exposure to cold, over-eating, irregular hours, cold bath, and exertion after meals should be avoided.

Patients with high tension feel better after a night's rest, but complete rest in bed during the day is not essential except when the signs of strain on the heart are present, viz., pain in the chest, breathlessness on slight exertion, palpitation and swelling of the feet. In other cases, mild outdoor exercise within the capacity of the patient may be taken. Many drugs and proprietary remedies have been advocated in the treatment of this trouble, but none has a permanent effect in keeping the pressure down. Nitrite of amyl, which is a liquid, is used for inhaling in an emergency when there is a sudden attack of pain as described under angina pectoris. Nitrite of sodium or a solution of trinitrine is given by the mouth to bring down the tension to tide over a threatened crisis. Bromide of potassium (No. 90) is given if there is mental anxiety, excitement or sleeplessness. The administration of 3 grains of calomel at bedtime once a week, followed the next morning by a saline draught is beneficial in such cases. Iodide of potassium, 10 to 15 grains, or organic preparations of iodine, thrice daily are useful in syphilitic or rheumatic cases. Electric treatment, by way of high frequency current, is useful in lowering the tension, but the effect is not lasting. Regular treatment with diathermy has a more lasting effect. In an emergency venesection becomes necessary. In some suitable cases

surgical treatment (sympathectomy) is beneficial.

**Aneurism.** An aneurism is a bulging of an artery which forms a sac filled with blood and pulsating with the heart beat. This is brought about by some disease or an injury to the arterial wall. In old days syphilitic disease of the arteries was responsible for a large number of cases, but the modern treatment of syphilis has practically done away with this cause. It affects the larger vessels in the chest, abdomen and limbs and the smaller ones in the brain.

A small one may not produce any symptoms, but when it enlarges, as it always does, it presses on the adjoining parts and produces pain, which is constant and boring when a bone is pressed, or intermittent and shooting when a nerve is involved. When the aorta in the thorax is affected the symptoms are due to pressure on the windpipe, gullet, lungs, heart and nerves; they are difficulty of breathing and swallowing, hoarseness, cough, palpitation and pain. When it expands in front it causes erosion of the breast bone, and forms a pulsating swelling in front, or it may erode the vertebrae behind. If in the abdomen, it can be readily felt when the patient lies in bed and flexes his thighs to relax the abdominal muscles. When in one of the limbs, a pulsating swelling can be seen and felt in the course of the artery.

An aneurism of the aorta, once it is fully developed, is not affected by any treatment and death takes place within three years either from rupture or some intercurrent disease. But if detected early and properly treated it can be kept under control, and life prolonged for years. Surgical treatment, when it is in an accessible place, affords good chances of recovery. A patient with an aneurism should avoid sudden and severe muscular efforts and mental excitement.

**Naevus.** It appears as a dark red spot on the skin or a swelling consisting of a mass of dilated capillaries or small blood vessels. It may be congenital or acquired; when former it is known as mother's mark or port wine stain and may be present in more than one place. When larger vessels take part in its formation it is called *angioma* which forms a soft swelling, spongy to the touch and is compressible. It may remain for life without giving any trouble, or may disappear spontaneously, or may increase in size, involve adjoining structures, or ulcerate and bleed freely. When it is small and shows no signs of increase, it is advisable to leave it alone, but when it spreads or bleeds surgical treatment is necessary. A small one can be destroyed by the application of carbonic acid snow (dry ice) or by electrolysis.

## FUNCTIONAL DISEASES OF THE HEART

The diseases of the heart are either functional or organic; in the former there is merely a disturbance of the function without any structural alteration, while in the latter there is some abnormal condition of the anatomical structure of the organ, viz., the muscle, valves or the membrane lining the cavities or covering it. The term heart disease is applied to a diseased condition of the valves. The functional disturbance is due to a nervous disturbance or a disease of some other

organ. The symptoms produced by the functional disturbance are pain in the chest, palpitation and irregular action. All these may be present in organic disease also. The common functional disturbances are heart pain, angina pectoris, pseudo-angina, irritable heart and palpitation.

**Heart Pain.** It is of a dull aching character, varying in duration and is felt on the left side of the chest, more often at night or when the patient is at rest. It is not sudden or severe as in angina pectoris, nor is it accompanied with distress or anxiety. It is due to digestive disturbances, excessive acidity of the stomach, excessive use of tobacco, strong tea or coffee, or chronic constipation. It is readily amenable to treatment and disappears as soon as the cause is removed. If due to an excess of acid in the stomach it is soon relieved by the administration of bicarbonate of sodium (No. 51 or 133).

**Angina Pectoris.** It is a severe and sudden attack of distressing pain in the heart area accompanied with a sense of oppression, anxiety, cold sweat, deathly pallor of the skin and a fear of impending death. It is more common in males than females and more prevalent in cities among intellectual classes than in villages and labouring classes. The tendency may be inherited and some generations have been known to have died from it. Syphilitic, gouty and diabetic persons with high blood pressure are very liable to get it. It rarely attacks persons below 50, but when it does it is practically always due to syphilitic disease. The onset is sudden, but usually after some physical exertion or mental excitement, or a heavy meal. The pain is excruciating and is primarily felt in the heart from where it radiates to the left shoulder and arm, and sometimes to the back of the neck. During an attack the patient is in great agony, is unable to move or utter a sound except an occasional groan, and his face is covered with cold sweat. The severity and duration of the attack vary in different persons and in the same person at different times; as a rule it subsides after a few seconds or minutes. As soon as the attack passes away the patient feels great relief, may pass a large quantity of urine and fall off to sleep. Subsequent attacks may come on at any time and without any cause. In some cases the very first attack is fatal. The patient may remain free from further attacks and lead a fairly comfortable life by carefully attending to the details of treatment, but the prospects of a person who had a severe attack are not very good. Persons with an even placid temperament who are able to adapt themselves to a quiet mode of living do well and remain free from frequent attacks.

The treatment for the immediate relief of pain consists in complete rest as soon as the patient feels the preliminary signs of an attack; he should lie down or sit wherever he is; and the inhalation of nitrite of amyl directly from a small bottle carried in the pocket. It is also available in thin glass capsules enveloped in cotton wool; one of these is broken between the thumb and fingers and the liquid, which is soaked up by the cotton wool, is inhaled. In a majority of cases it stops the pain or reduces its severity and duration, unfortunately the relief afforded is temporary and in very severe cases it is meagre. When it fails or when the paroxysms recur rapidly it becomes necessary to

give a hypodermic injection of morphine  $\frac{1}{3}$ rd to  $\frac{1}{2}$  a grain, combined with  $\frac{1}{100}$ th of a grain of hyoscine hydrobromide. This is repeated after three hours if necessary, or is followed by a sedative draught containing 10 grains of chloral hydrate and 15 of bromide of potassium in an ounce of water. If these drugs are not available, as in the case of a sudden attack, hot fomentations should be applied continuously over the heart area.

For the prevention of recurrence of an attack the patient should avoid sudden and severe exertion and mental strain. Mild exercise, such as walking on a level ground, well within his tolerance may be taken. Overeating, late or heavy meals, excess of alcohol and excessive use of tobacco in any form and of strong tea or coffee are to be avoided. The diet should be light and strictly limited in quantity. Rest for an hour after meals is advisable as attacks are common after food. Constipation, if present, should be treated with mild aperients. Any tendency to obesity should be met with by reducing the quantity of food (see Obesity). For sleeplessness or disturbed sleep an occasional draught of bromide (Nos. 65 or 87) might be taken an hour before bedtime. In suitable cases surgical treatment gives relief from the attacks of pain, but it does not remove the cause of the trouble. Gout, rheumatism, syphilis or any other disease that may be present requires treatment.

**Pseudo-angina.** This is a condition in which there are occasional attacks of heart pain which occur in persons suffering from indigestion, constipation or indulging in excess of strong tea, coffee, or tobacco. There is no structural disease or high blood pressure and the attacks are not severe and subside readily as soon as the cause is removed.

**Irritable Heart.** It is also known as the disordered action of the heart. In this a series of symptoms referable to the heart are found in a person after slight physical exertion; these are palpitation, pain, difficulty of breathing, fatigue and faintness. The condition is common among conscripted soldiers who have poor muscular development and who are not used to hard work. The pain is not severe and is confined to the heart area. It is not necessary for the patient to take complete rest, but should take mild and gradually increasing exercise without getting out of breath or fatigued. The diet should be liberal and should contain sufficient sugar and fat, and he should have sufficient rest and sleep at night. Cold bath, if the patient is able to bear it, and massage of the limbs are useful in improving the tone of the muscles. Most patients, except those who have a hereditary weak constitution, respond to treatment readily.

**Palpitation of the Heart.** See page 55, Part I.

## ORGANIC DISEASES OF THE HEART

All these are serious conditions and require professional skill for their diagnosis and treatment. Some of the common ones are described here.

**Pericarditis.** Pericardium is the membrane that covers the heart and lines the cavity in which the organ is situated, and its inflammation

is known as pericarditis, which may be acute or chronic. It may be due to an infection from a septic focus in the body, rheumatic fever, an acute infectious disease or in some cases it is produced without any evident cause. In acute cases there may be an accumulation of fluid in the cavity, which may be so much as to cause distress by impeding the action of the heart. Pain may be present which may be slight and no more than a feeling of discomfort, or it may be severe and aggravated on deep breathing, sneezing or coughing. Fever is present but is not high, palpitation, difficulty of breathing, restlessness and sleeplessness are present. In chronic cases the symptoms are not very urgent.

The patient should remain in bed so as to spare the heart any strain; and the diet should be light and easily digestible. The primary condition that might be present requires suitable treatment. If the fluid in the cavity is in excess and impedes the action of the heart it can be removed by tapping.

**Diseases of the Myocardium.** Myocardium is the heart muscle which is subject to many morbid conditions, due to inflammatory or degenerative changes; the former is secondary to some acute infectious disease and is more common in childhood and early adult life, while the latter is more prevalent in old age, and is the result of restricted blood supply in arteriosclerosis, or general nutritional deficiency, as in starvation, under-nourishment and chronic wasting diseases. In toxic goitre (*q.v.*) the heart muscle is affected on account of the constant heavy work thrown on it.

The symptoms are pain and a sense of oppression in the heart and disturbed rhythm, and in severe cases signs of circulatory failure, viz., difficulty of breathing, blue colour of lips and fingers, weak pulse and puffy swelling of the face and lower limbs. Mild cases recover within a few days or weeks, or the acute stage may pass leaving the patient with a permanently damaged heart; severe cases may die from heart failure. The treatment of acute cases is to give the heart muscle the minimum of work; for this purpose the patient has to remain in bed and not to get up at all. The administration of drugs is not necessary except in failing circulation, for which  $1/64$ th of a grain of strychnine, or 5 minims of the solution of strychnine with 5 to 10 minims of tincture of digitalis or one of its many preparations are given. These drugs are very potent and great care and precautions are necessary in administering them.

**Chronic Myocarditis.** It is more common after middle life, and may be the continuation of an acute attack or it may develop gradually. Syphilitic disease of the heart and persistent high blood pressure are the two most common causes of this trouble. It may not produce any other symptoms than palpitation and shortness of breath after slight exertion. Usually the patient has disinclination for work and soon gets tired and out of breath. He is unable to hold his breath for any length of time, which is a sign of cardiac inefficiency. The preventive treatment for this condition is, taking all precautions when suffering from one of the acute infectious diseases. During the course of any

of these the heart should be spared as much strain as possible, and the convalescence sufficiently prolonged to give it enough time to get over the toxic effects. Strychnine, iron and other tonics are administered except when the trouble is caused by high blood pressure.

**Endocarditis.** It is an inflammation of the endocardium, i.e., the membrane lining the cavities of the heart and the valves. It may be acute or chronic, and simple, i.e., non-bacterial or bacterial; the latter is also known as ulcerative or malignant on account of its severity. The simple variety usually follows acute rheumatism or one of the infectious diseases; the chronic variety is associated with valvular disease of the heart. It is not necessarily fatal, but any affection of the valves is a serious condition which shortens life. It can be prevented by cutting short the attack of acute rheumatism which is the most common cause of the trouble. Rest in bed for a prolonged period is essential even after the attack of rheumatism or other infectious disease has subsided.

The ulcerative variety is very serious, and before the introduction of sulpha drugs and penicillin it used to be a very fatal disease. Persons suffering from chronic endocarditis or valvular disease should take every precaution against any kind of septic infection because the simple inflammation is very likely to be converted into the ulcerative variety. For this purpose the mouth, teeth, tonsils and any wound on the body should receive immediate attention.

**Valvular Disease of the Heart (Heart Disease).** The function of the valves in the heart is to allow the flow of blood in one direction when the heart contracts, and prevent its regurgitation when it dilates. When diseased, they become hard and distorted and are unfit for their normal function; they obstruct the onward flow of blood or allow it to regurgitate or do both. This diminishes the force of circulation and reduces the supply of blood to different parts and organs of the body. One or more of the valves may be involved. In order to keep up the necessary supply of blood, the heart has to work more vigorously, so the muscle is subjected to great strain. Normally, the heart muscle has a considerable amount of reserve power which is called into play to meet occasional increased demands. In valvular disease on account of constant strain the reserve power is soon used up, but under favourable circumstances the heart muscle increases in size and strength and maintains the circulation. This is known as compensation which may carry on the circulation unless sudden great strain is thrown on the heart, in which case the compensation fails even after it is established. When this happens the muscle becomes thin and the cavities are distended, the condition being known as dilatation of the heart which may ultimately cause complete failure of circulation.

The normal heart sounds, as heard through a stethoscope, are characteristic and are due to the muscular contraction and sudden closure of the valves. These sounds are altered in character or are replaced by abnormal sounds on account of the obstruction to the flow of blood or its regurgitation. By locating these sounds and timing them with respect to the contraction of the heart it is possible to determine which of

the valves is diseased and whether it causes obstruction or regurgitation. One of the important symptoms of failing circulation is shortness of breath on slight exertion; it may be present constantly and even when the patient is at rest, and in very bad cases he is unable to breathe when lying in bed, and has to sit up or has to be supported in bed all the time. Pain and palpitation are also present and there is puffiness of the face and swelling round the ankles. It is at first marked in the pendant parts but gradually extends to all other parts until the end, which may come gradually or suddenly.

The valvular disease of the heart is incurable, but with proper care and treatment life can be prolonged. The most important part of the treatment consists in giving the heart as little work as possible so that compensation might be established. For this purpose prolonged rest in bed and freedom from mental strain are necessary. The stomach should never be overloaded and the food should be light and easily digestible, and the bowels should be regulated by mild purgatives. When all the symptoms have subsided, walking exercise may be indulged in provided it does not bring on breathlessness or palpitation. In failing circulation digitalis, strychnine and caffeine are used.



## CHAPTER VII

### DISEASES OF THE ALIMENTARY SYSTEM

#### DISEASES OF THE MOUTH

**Stomatitis.** Stomatitis is an inflammation of the mucous membrane of the mouth which may be acute or chronic and which is met with in different forms, viz., (1) Redness and swelling of the mucous membrane generally due to irritation by hot foods or drinks or by an irritant substance. This does not require any treatment except an antiseptic mouth-wash occasionally. (2) Vesicular stomatitis, in which there are small vesicles either singly or in clusters. It is found in persons with chronic dyspepsia or intestinal trouble or after an attack of an acute fever; very often there is no apparent cause. (3) Ulcerative stomatitis, caused by bacterial infection, in which there are small ulcers in the mouth. Badly nourished children are prone to get it after an attack of an acute fever. The gums are affected and the teeth become loose and fall out. The mouth should be frequently washed with peroxide of hydrogen or a solution of permanganate of potassium and measures taken for the improvement of the general health. The diet should contain fresh vegetables, fruit, milk and eggs. Potassium chlorate mixture (No. 69) given three times a day is beneficial. (4) A severe and fatal kind of stomatitis occurs in ill-nourished and debilitated children between the ages of 2 and 5 which is common during a famine and which is known as gangrenous stomatitis, *cancrum oris* or *noma*. The earliest symptom is an offensive smell from the mouth. A small dark hard patch appears on the cheek, lips or gums which soon becomes gangrenous, destroys the whole thickness of the cheek or lips and spreads to the surrounding parts. There is great prostration but pain is absent and death takes place within a week or so. The treatment for this condition is very unsatisfactory; a very early and thorough excision of the patch when it appears gives the child some slender chance to get over it. (5) A chronic variety of stomatitis, known as *thrush*, is due to an infection of the mucous membrane by a fungus. It is met with in weakly children and in adults in the course of an exhausting illness. Slightly raised patches of greyish colour appear on the mucous membrane which are painful on mastication. The treatment consists in frequently washing the mouth with an antiseptic lotion and attending to the general health. In any prolonged illness the mouth should be regularly cleaned with boric glycerin and hydrogen peroxide as a preventive.

**Glossitis.** By glossitis is meant an inflammation of the tongue which may be acute or chronic. The causes and symptoms are the same as for stomatitis as also the treatment. An abscess may form which will require surgical treatment.

**Excessive Salivation.** Normally a small amount of saliva is constantly secreted to keep the mouth in a moist condition. The smell or sight of an appetising food or even the mention of it, especially

when the stomach is empty, causes a free flow of saliva; it may also be caused by stimulation of an acid substance or some drugs taken internally, such as iodide of potassium, salts of mercury, pilocarpine, etc. In seasickness, hysteria, migraine and in a sudden emotional shock excessive salivation may be produced on account of nervous disturbance. In some cases no apparent cause can be found. The treatment is to remove the cause. In some cases the administration of preparations of belladonna temporarily diminishes the secretion.

**Dryness of the Mouth.** Apart from thirst, the dryness of the mouth is caused by an excessive loss of water from the body through the skin, bowels, kidneys or the stomach, as happens after severe exercise, diarrhoea, cholera, frequent micturition in diabetes or persistent vomiting. Certain drugs, such as opium, belladonna, datura, etc., cause dryness of the mouth. The treatment is to remove the cause and replace the fluid lost. In fever liberal quantities of mild refreshing drinks are given and the mouth frequently painted with glycerin to relieve the unpleasant sensation of dryness.

**Tonsilitis.** It is an acute inflammation of the tonsils due to bacterial infection which is met with in children and young persons with enlarged tonsils. These become red, swollen, painful and cause difficulty of swallowing. The treatment consists in frequent antiseptic gargles, application of glycerin carbolic acid to the tonsils and fomentations behind the angle of the jaw.

**Abscess of the Tonsil.** See Quinsy.

**Enlargement of the Tonsils.** It is a chronic trouble and is usually associated with adenoids which is an overgrowth of the lymphatic tissue behind the nasal cavities and the throat. This occurs in children between the ages of 2 and 12 and unless properly treated may persist in adult life and unfavourably affect the growth, health and intelligence of the child. They project into the throat from each side and can be seen as large round masses when the mouth is opened. The child sleeps with his mouth open, has difficulty in breathing which disturbs his sleep and wakes him up with a start or scream due to nightmares. The nostrils remain narrow and undeveloped and the palate small and arched. The deficient entry of air alters the normal shape of the chest, makes it small and narrow and is the cause of low vitality of the child who is very liable to frequent attacks of cold and cough. He is dull at his studies, listless, nervous and slow in speech and movement. The hearing may be defective.

In some cases the trouble subsides to some extent with age, but is apt to leave behind some permanent ill effects. For this reason it is very advisable in the interest of the child to have the enlarged tonsils and the accompanying adenoids removed as soon as possible and before any permanent harm is done. The operation is safe and simple and the beneficial effects are prompt and certain. The presence of haemophilia or any other disease likely to add considerably to the risk is a contraindication for the operation. After the operation the patient is kept in bed for a week and given liquid diet. When, for some reason, the operation cannot be undertaken the administration of cod liver or

halibut oil, tonics, outdoor exercise and other measures for the improvement of health are indicated.

**Malignant Disease of the Tonsil.** This mostly occurs in young persons and is of the nature of sarcoma (*q.v.*). It grows very rapidly and being painless in the beginning its presence is not suspected until it is too late. It causes obstruction to breathing, swallowing and speaking. In the early stages exposures to radium and X-rays has been found to be beneficial.

### DISEASES OF THE OESOPHAGUS (GULLET)

**Obstruction of the Gullet.** This may be temporary and caused by a spasm of the circular muscle in the wall of the gullet. It is found in neurotic hysterical persons and can be overcome by gently passing specially made soft bougies. It may also be caused by a foreign body accidentally swallowed, very often a badly fitting tooth-plate. If small and smooth it can be pushed down into the stomach with food or drink but if it is large and rough it has to be located by means of X-rays and removed with special instruments. The most serious and intractable obstruction is caused by a growth in the gullet, usually a malignant one which is found in old persons. Pressure on the gullet from outside of a tumour growing in the chest, very often an aneurism, is another serious cause of obstruction. When it is complete the patient is unable to swallow any food and is starved to death. The life may be prolonged for some time by feeding him through an opening made in the stomach.

### DISEASES OF THE STOMACH

Functional diseases of the stomach, viz., dyspepsia, indigestion, etc., have been described elsewhere.

**Gastritis.** It is the inflammation of the stomach and may be acute or chronic. It is usually met with in an acute form in irritant or corrosive poisoning. In mild cases the symptoms are not marked, but in severe cases there is disinclination for food, pain and a sense of fullness after food, nausea and vomiting. In more severe cases there may be blood in the vomited matter. Chronic gastritis may be the result of an acute attack or may be due to frequent indiscretion in diet and abuse of alcohol. The trouble subsides with the removal of the cause, rest to the stomach and very light diet. The teeth require attention and a dentist should be consulted even if there is no apparent trouble with them. In obstinate and chronic cases the stomach requires washing out morning and evening with a solution of bicarbonate of sodium, 1 drachm to a pint of tepid water.

**Gastric Ulcer** or Ulcer of the Stomach. It is also known as peptic ulcer and may be situated in the stomach or the duodenum, i.e., the first part of the small intestine. It is more common among meat eaters than vegetarians and in European than Asiatic countries. The acute variety is more common in women between the ages of 20 and 30, while the chronic variety is more frequent in men between 30 and

50. Hyperacidity of the stomach is often associated with it.

The patient may not have any prominent symptoms for some time, but there is a history of some gastric disturbance which is intermittent with varying periods of freedom from symptoms, or the symptoms may be entirely absent until the ulcer perforates the stomach or erodes a blood vessel and causes severe bleeding and sudden shock. The chief symptom is pain of a dull aching or burning character, which is felt in the pit of the stomach or on either side of it. It appears after a certain interval after meals and gradually disappears or may continue till the next meal which relieves it for a short time. Vomiting may take place when the pain is at its height and gives relief. The vomited matter is very acid and may contain a little dark blood which is bright red if the quantity is large, or it may be so little as to require chemical examination for its detection. The appetite is not diminished but the patient reduces the intake of food for fear of pain. An examination with X-rays may show the presence of an ulcer if it is deep.

Many cases recover with diet and proper treatment, but a small proportion of these relapse after a time, some become chronic and suffer for a long time, while in others perforation of the stomach or dangerous bleeding from the erosion of a blood vessel may take place. In a small proportion of chronic cases cancerous changes take place in the ulcer.

The first essential of treatment of the gastric ulcer is as much rest to the stomach as possible; for this purpose the food should be liquid and non-irritating. Milk diluted with barley water with the white of an egg dissolved in it and sweetened with glucose, and clear vegetable soup with very little salt should be given in small quantities at a time at frequent intervals. All physical exertion and mental strain are to be avoided. Constipation, which is usually present, is relieved by mild saline purgatives, such as milk of magnesia or carbonate of magnesium. The diet may be gradually increased by the addition of salt free butter, eggs, boiled fish or chicken. In case there is much pain and bleeding, rectal feeding by nutrient enemata (page 196, Part I) may be continued until the acute symptoms subside.

Of the drugs, the only ones that are of any use are the alkalis, such as bicarbonate of sodium, carbonate of magnesium or calcium, milk of magnesia, etc. A mixture containing 20 grains each of bicarbonate of sodium and carbonate of magnesium and 15 grains of carbonate of calcium or subcarbonate of bismuth is given thrice daily an hour after food. If the symptoms persist and severe pain continues in spite of the above treatment or if there is much frequent bleeding surgical treatment becomes necessary. In case of perforation prompt surgical operation is the only treatment to save the life of the patient.

**Enteritis.** Enteritis is the inflammation of the intestine. It is fairly common in adults in hot weather and is due to contamination of food or milk, mostly by flies, eating unripe or overripe fruit, strong purgatives or irritant poisons. Diarrhoea is the chief symptom which is accompanied with colicky pains, flatulence, rumbling noises in the abdomen and loss of appetite. Usually the attack subsides after 2 or 3 days. The treatment is to give the bowel rest and take liquid diet.

A dose of castor oil in the beginning is useful in getting rid of the irritating substance from the bowel, but this is not necessary if the diarrhoea has continued for two days. If there is pain and the condition does not improve with rest and diet a few doses of bismuth and opium mixture (No. 64) might be given or if there is much flatulence carminative mixture (No. 67) will be beneficial.

Enteritis in children is met with in a more severe form and is due to contaminated milk, faulty diet containing too much starch, irregular hours of feeding, irritant substances, teething, rickets and sometimes a chill. The stools are very frequent and watery and in rickets and teething they are green, there is much windiness and the child constantly cries from pain. The treatment is to evacuate the contents of the bowel as soon as possible; for this purpose castor oil is the best and may be given in the form of an emulsion (No. 97). Starch and indigestible articles should be omitted from the diet. The green diarrhoea of teething is benefitted by the administration of  $\frac{1}{2}$  a grain of Grey powder (No. 143) two or three times a day. It should be continued until the colour of the stools becomes normal. For flatulence carminative mixture (No. 96) might be given thrice a day. Fomentations of the abdomen and glycerin enemata are useful in relieving colicky pain and flatulence.

**Colitis.** It is an inflammatory condition of the colon and may be acute or chronic. The former is sometimes found in acute infectious diseases and the latter is mostly due to bacterial infection and is very often a manifestation of a mild form of dysentery. Chronic constipation is associated with it and is an important predisposing cause. Tubercular disease also produces an obstinate variety of chronic colitis. It is called mucous colitis when a large quantity of mucus is passed; ulcerative when there are ulcers present, and membranous when large or small membranous casts are discharged with the stool. The acute variety comes on suddenly and subsides after 4 or 5 days with treatment, but in old and debilitated persons it becomes chronic. The stools are profuse and may contain mucus and blood and are preceded or accompanied with colicky pains. The patient is poorly nourished and suffers from various nervous symptoms and anaemia. The breath is usually offensive as also the stools.

Acute colitis can be controlled by a dose of castor oil given in the beginning, rest, light non-irritating diet, hot fomentations to the abdomen and the administration of salts of bismuth with or without opium (No. 62 or 64). Normal diet should be restored very gradually and any tendency to constipation removed by appropriate remedies.

In the treatment of chronic cases diet and general hygiene play an important part. Prolonged rest is not necessary but the patient should remain in bed as much as possible during the early stage until the urgent symptoms have subsided, usually for a week or two after which he should regularly have mild open air exercise. Regular hours for food, sufficient rest and sleep and protection from exposure are necessary.

## DISEASES OF THE LIVER

The liver is subject to many diseases including malignant tumours, but the more common ones are described here.

**Acute Yellow Atrophy of the Liver.** It is a fatal disease of the liver in which its size is much reduced on account of the destruction of its cells, with intense jaundice and symptoms of toxæmia. It is caused by some kind of poisoning, particularly trinitrotoluene (T.N.T.), arsenical compounds, certain synthetic drugs taken indiscriminately for long, syphilitic disease and chronic alcoholism. Pregnant women are liable to get it and it is more common in women than in men. In some parts of Gujarat it is known as *kamli*, i.e., feminine of *kamlo* which means jaundice. The disease commences like simple jaundice and for 4 or 5 days or so there is no indication of its seriousness when suddenly the severe symptoms develop. The patient has vomiting, headache, bile in the urine, convulsions, delirium, noisy breathing and coma which ends in death. The disease lasts for two weeks or so.

The treatment consists in maintaining the strength by liquid diet, giving plenty of water sweetened with glucose and containing a little bicarbonate of sodium and purgatives to relieve constipation.

**Cirrhosis of the Liver.** This is a chronic inflammatory disease of the liver in which its cells are destroyed on account of an excessive growth of the intervening fibrous tissue. It is usually met with in persons who habitually indulge in excess of strong spirits or distilled liquors, but may be due to some other toxin as it is sometimes met with in children and persons not addicted to alcohol. Habitual use of highly spicy food is also a contributory cause. The disease remains latent in many cases and does not produce any prominent symptoms during life. The patient has a furred tongue, muddy skin, dilated veins on the face, offensive breath, nausea in the morning and constipation or sometimes diarrhoea. Bleeding from the nose, stomach or bowels may take place. The liver is enlarged in the early stages and can be felt below the margin of the ribs, but later it contracts to a small size. As the disease advances the face becomes puffy, legs are swollen and fluid accumulates in the abdomen and the patient has well-marked dropsy. Towards the end there are delirium, convulsions and drowsiness.

The treatment consists in stopping all alcohol and giving the patient large quantities of water or barley water to drink. The diet should be plain and free from spices and an excess of nitrogenous substances. Regular use of a mild saline purgative, even if there is no constipation, is beneficial. For this purpose one of the mineral waters or a drachm or two of sulphate of magnesium in half a tumblerful of water an hour before breakfast should be taken. For loss of appetite an alkaline stomachic mixture (No. 52) thrice a day and for dropsy frequent purgatives and diuretic mixture (No. 75) might be taken. The collection of fluid in the abdomen, when it causes discomfort from pressure, requires tapping which has to be repeated as the relief afforded is temporary and the fluid collects again.

**Peritonitis.** Peritoneum is the smooth membrane which lines the

abdominal cavity and almost all the organs contained in it. It is subject to many diseases, mostly secondary to some condition affecting one of the organs, the most common and usually fatal being an acute suppurative inflammation secondary to appendicitis (*q.v.*). Perforation of the stomach in chronic gastric ulcer, of the bowel in typhoid fever, of the suppurative gallbladder or of an abscess of the liver are among the other frequent causes of peritonitis. The condition may be localized by the formation of protective adhesions round the infected focus, but as the pressure in an abscess increases it breaks through the adhesions and infects the whole peritoneal cavity with serious results, unless the abscess is opened in time and the pus let out. Rough handling or movements by the patient may also bring about the same result.

The onset of acute peritonitis is sudden with severe and constant burning or boring pain in the abdomen which is aggravated on movement or pressure. Vomiting is a constant symptom, at first the contents of the stomach, then dark green and finally brown offensive matter is thrown up. There may be one or two scanty motions in the commencement, but later on, on account of the paralysis of the bowels there is complete constipation. Prostration is well marked and the patient lies listless on his back with the legs drawn up to relax the abdominal muscles and has a worried anxious expression on his face. There is a slight rise in the temperature and the pulse is very fast. The condition gets progressively worse and death takes place in three to six days from exhaustion.

Once the disease has fully developed no treatment is likely to be of any use. Under the circumstances the patient is kept in as comfortable a condition as possible and feeding done per rectum; pain may be relieved by preparations of opium or morphine. In the early stages and before the infection becomes general the treatment is surgical and the sooner it is undertaken the better the chances of recovery, the delay of a few hours may turn the scales against the patient. He should remain in bed, avoid any movement and purgatives and not have rough handling or massage of the abdomen.

## CHAPTER VIII

### DISEASES OF THE RESPIRATORY SYSTEM

#### DISEASES OF THE NOSE

The two nasal cavities are separated by a vertical partition called the septum, which forms the inner wall of each of them. The outer wall has three curved plates of bone, called the turbinated bones, projecting more or less horizontally into the cavity. The mucous membrane lining the cavities is constantly kept moist by the secretion from tiny mucous glands. The inhaled air coming in contact with the warm moist mucous membrane is warmed and cleared of dust before entering the lungs. The object of these bones is to offer a larger surface for this purpose. There are some hollow cavities, called sinuses, in the bones of the face which communicate with the nasal cavities through narrow openings. These sinuses are liable to be infected from the nose resulting in sinusitis or suppuration in them. As the abscess is confined in a bony cavity it is liable to be chronic and troublesome. Constant pain, occasional profuse discharge from the nose when the patient assumes certain positions, low fever and general ill-health are the symptoms. Early surgical treatment to open the cavity and drain the pus is advisable to prevent further mischief.

**Acute Nasal Catarrh.** See Coryza (page 38, Part I).

**Chronic Nasal Catarrh.** This may result from frequent acute attacks, but is more often met with in young persons with adenoids (*q.v.*). The mucous membrane of the nose becomes hypersensitive causing frequent attacks of sneezing from inhaling cold or warm air or dust-laden atmosphere and often without any cause. The mucous membrane remains swollen and obstructs the passage producing mouth-breathing, dry mouth, partial or complete deafness and a tendency to catch cold. In some old cases the membrane is atrophied and produces an offensive discharge which dries into crusts.

The treatment consists in early removal of adenoids if present, keeping the nasal cavities clean by frequent douche with saline solution, a drachm of common salt in a pint of water which has been boiled, with 30 grains of bicarbonate of sodium, and applying an astringent application (No. 31) three times a day. The administration of cod liver oil, vitamin pills and plain nourishing diet are also necessary.

**Nasal Polypi.** A polypus is a soft gelatinous growth, usually multiple, arising from the mucous membrane of the nose and attached to it by a pedicle. They project into the nasal cavity and have a tendency to grow in size and block the passage. They swell and become worse in wet weather. They are frequently associated with chronic suppuration in one of the sinuses. A fibrous kind of polypus also grows from the roof of the nasal cavity which, sooner or later, tends to be malignant. It grows rapidly and pushes forward the bridge of the nose, presses on the eyeballs and causes disfigurement.

The treatment is surgical and should be undertaken early. The soft variety is easily removed with a specially made wire snare, the loop

of which is passed round the growth and gradually tightened until it cuts through the pedicle. It may require more than one sitting to remove them all. The fibrous variety requires very early attention and can be removed completely when not very large with an electric snare and the base is destroyed with an electric cautery which prevents bleeding. Exposure to radium X-rays has been found to be beneficial if undertaken early and before the inflammation of surrounding parts takes place.

**Adenoids.** These are a fleshy-looking overgrowth of the soft lymphoid tissue in the upper part of the throat and the back of the nasal cavities. They are usually associated with enlarged tonsils and are met with in children living in the dusty atmosphere of large cities and are rare in those living in rural areas. They have a tendency to disappear when the child grows up but in the meantime they do a good deal of permanent mischief. They block the nasal passage so that the child constantly breathes through the mouth, as a result of which the nostrils are narrow, the nose small and pinched, the upper lip drawn back exposing the front teeth and the chest flattened and undeveloped. The child has a dull sleepy expression, is inattentive and backward in his studies. He gets frequent attacks of cold and is very liable to get tuberculosis of the lungs. The voice has a nasal twang and hearing is defective.

As the condition is very likely to produce permanent harmful effects on the health, growth and intelligence of the child it is very advisable to have them removed as soon as possible and get rid of the enlarged tonsils also. The operation is simple and its beneficial effects so prompt and marked that unless it is contraindicated for some reason it is not wise to wait till they disappear spontaneously.

### DISEASES OF THE LARYNX

**Catarrhal Laryngitis.** Catarrhal inflammation of the larynx may be acute or chronic. Some persons, especially mouth-breathers, are predisposed to it and get frequent attacks from trivial causes. An acute attack is caused by inhalation of dust or irritant vapours, excessive smoking, improper use of the voice or sudden exposure to cold air. It is often associated with catarrh of other parts of the respiratory tract. Hoarseness, a feeling of soreness and dryness and slight fever are the usual symptoms. The trouble subsides after a few days or may drag on and become chronic.

The treatment is to give rest to the inflamed larynx by not using the voice much and remain in bed as long as there is fever. Dryness and soreness are relieved by the inhalation of steam impregnated with soothing drugs (No. 34) and the irritating cough by chlorate of potassium and syrup of codeine phosphate (No. 69) internally and hot applications to the outside.

Chronic laryngitis may result from the continuation of an acute attack or it may come on slowly. It is common in mouth-breathers, excessive smokers and those constantly exposed to dust and chemical fumes. Huskiness of the voice, frequent irritating cough and an itching

sensation in the throat are the usual symptoms. The treatment is to remove the cause and give the larynx as little work as possible, apply some astringent (No. 31) to the throat two or three times a day and heat to the outside. Mouth-breathing, if present, requires appropriate treatment.

**Oedema of the Larynx.** It is a condition in which the mucous membrane of the larynx is much swollen, so much so that the opening is narrowed considerably or is completely obliterated. It is secondary to some affection of the organ or the neighbouring parts. It may arise in the course of syphilitic or tubercular disease or from irritation by a corrosive substance, scalding food or drink or a foreign body impacted in it. There is rapidly increasing difficulty of breathing or it may develop suddenly and cause fatal suffocation. The treatment is to put the patient to bed and give him pieces of ice to suck, apply ice-compresses on the outside and give inhalations of steam with soothing drugs (No. 34). If the condition tends to get worse or suffocation is threatened, early surgical operation becomes necessary to save the life of the patient.

The larynx is subject to other diseases, such as tuberculosis, syphilitic disease, etc., which are mostly secondary and do not require any special treatment apart from that for the primary condition.

**Child-crowing.** It is an ailment of childhood in which, on account of a sudden spasm of the larynx and the muscles of respiration, the breathing is stopped. It is met with in children living under defective hygienic conditions and suffering from malnutrition, rickets, etc. The exciting cause is indigestion, teething trouble or sometimes fright. It comes on suddenly when the child is asleep when the breathing suddenly stops, the face becomes livid and suffocation seems imminent, but just as suddenly the spasm relaxes and air rushes into the lungs with a crowing noise. The paroxysm subsides after a time but may recur several times during the night or day. The condition is not dangerous and is rarely fatal. The child should be kept warm in bed and during an attack placed in hot bath, and cold water dashed on his face and head. Potassium bromide (No. 95) given three times a day reduces the tendency. Rickets, indigestion and other morbid conditions present require treatment. The last meal of the day should be light and given not less than two hours before bedtime.

**Acute Bronchitis.** Bronchitis is the inflammation of the bronchial tubes in the lungs which may be acute or chronic. It attacks persons of any age but is more common and serious in infancy and old age. Debility from any cause, diseases of the heart or kidneys, rickets, bad hygienic conditions and living in badly ventilated rooms are the predisposing causes. The attack is brought on by a sudden change of temperature, exposure to cold or wet when the body is fatigued, or by inhaling irritant vapours.

It begins with chilliness, slight fever and malaise. In infants and old persons high fever and much constitutional disturbance are present. There is dry cough, a sense of dryness and soreness in the chest and a little frothy sputum. Later the sputum becomes more free and muco-

purulent. These symptoms abate after some days or the attack may be prolonged in infants and debilitated persons.

Rest in bed in a well ventilated room free from draughts until fever and other symptoms have abated is very necessary. In the beginning a hot mustard foot-bath and a hot drink followed by rest in a warm bed relieve the congestion of the lungs by inducing free perspiration and reduce the severity of the attack. A hot decoction of cinnamon bark, cardamoms, black pepper and dry ginger sweetened with a little honey and containing a little brandy is a good diaphoretic after the foot-bath. Dover's powder, 10 grains (No. 139), helps to increase perspiration and lessen the cough. It contains opium and should not be given to infants and old persons unless prescribed by the doctor. Inhalation of steam impregnated with soothing drugs (No. 34), hot fomentations and poultice to the chest, applications of stimulating liniment (No. 38), and the administration of one of the cough mixtures (No. 72 or 73) three times a day are useful in relieving the cough and soreness. In infants and old persons when signs of defective oxygenation, viz., lividity of the face, rapid breathing and distress, are present inhalation of oxygen becomes necessary.

**Chronic Bronchitis.** It may result from repeated attacks of acute bronchitis or from constant inhalation of irritant vapours or dust. Elderly persons suffering from kidney or heart disease are very liable to get it. Some persons get attacks of bronchitis regularly in cold or wet season and the tendency continues with varying severity during other seasons. Cough and expectoration of muco-purulent sputum are the prominent symptoms and breathlessness in old cases.

The treatment is to remove the cause and guard, against cold and wet with suitable clothes. Gout, heart or kidney disease, if present, requires appropriate treatment. Cod liver or halibut oil, tonics, vitamins and nourishing diet are necessary to build up the resistance of the body. Hot fomentations, application of liniment, inhalation of steam and the administration of cough mixture are the same as for acute bronchitis.

**Bronchiectasis.** The term is applied to permanent dilatation of the bronchial tubes on account of frequent attacks of bronchitis. The symptoms are mostly those of chronic bronchitis in addition to certain distinctive ones of this condition. Cough occurs in paroxysms with profuse expectoration mostly in the morning when the patient gets out of bed, the intervals between the paroxysms being almost free. The sputum on standing separates in three layers, the upper one frothy, the middle clear of a greyish colour, and the lowest thick and purulent. There is breathlessness on exertion. The treatment is to take as much rest as possible, nourishing diet, mild open-air exercise, and to adopt other measures for the promotion of health. For the fetor of the breath inhalations of antiseptics (No. 33 or 34) are useful.

**Broncho-pneumonia.** It is also called lobular pneumonia to distinguish it from lobar pneumonia (*q.v.*) in which one or more lobes of the lungs are affected, while in the lobular variety small lobules are involved. It is commonly met with in debilitated old persons and children under five who are badly nourished and live under unhygienic

conditions, and as a complication of measles, whooping cough, diphtheria or some other infectious disease. For such patients the outlook is very serious. It is ushered in by fever, restlessness, cough, difficulty of breathing and other constitutional symptoms.

The patient requires complete rest in bed with plenty of fresh air, light nourishing diet and the same treatment as for bronchitis. The administration of sulpha drugs and penicillin is beneficial and cuts short the disease when the causative micro-organisms are susceptible to these drugs. Oxygen inhalation may be necessary when the signs of defective oxygenation are present.

**Pulmonary Emphysema.** It is a condition in which the alveoli, i.e., the minute cavities in the lung into which the smallest branches of the bronchi terminate, are dilated on account of loss of elasticity of their walls from constant increased air pressure in them from persistent coughing in chronic bronchitis or asthma. It is also met with in glass blowers and musicians who use wind instruments. The onset is gradual and the disease, once established, is progressive. The earlier symptoms are those of the primary disease, but when it is fully developed shortness of breath and lividity on least exertion are marked. Attacks of acute bronchitis are common, at first during the cold months, but later during the summer also. The permanent expansion of the lungs alters the shape of the chest which becomes barrel-shaped. The constant strain on the heart produces cardiac inefficiency ultimately resulting in its failure and death, unless pneumonia or some other diseases hastens the end.

The preventive measures and treatment are the same as for chronic bronchitis. The patient need not remain in bed except when the symptoms of circulatory failure are present, in which case complete rest, light diet and cardiac stimulants (No. 89) are necessary. In sudden cardiac distress with difficulty of breathing, lividity, etc., blood letting, diaphoretics, diuretics (Nos. 74 and 75) and oxygen inhalation are required.

**Gangrene of the Lung.** It is secondary to some disease of the lung and is met with in persons suffering from tuberculosis, diabetes or a protracted attack of an infectious fever. A foreign body in the lung or inhalation of septic matter from the mouth, nose or throat may produce it; while in some cases there is no apparent cause. The patient's condition is very low and from the onset there is a very offensive smell in his breath and sputum which fills the whole room. Fever and extreme prostration are present and the patient dies of exhaustion. Recovery is possible if a very limited part of the lung is involved. The gangrenous tissue is not accessible to surgical treatment and very little can be done for the patient. Rest in bed, nourishing diet and antiseptic inhalations (No. 33) and the treatment for the relief of symptoms are indicated.

**Pleurisy.** The inflammation of pleura, i.e., the membrane covering the lungs and lining the thoracic cavity, is called pleurisy. It may be acute or chronic, or local when a small area is affected, or general when the entire membrane is involved. Usually it is secondary to some

disease of the lung, such as pneumonia, tuberculosis, etc., and is often a complication of infectious fevers or rheumatism. An injury of the chest wall or the fracture of a rib may cause it. As a primary disease it is the result of a chill. It may produce a collection of fluid in the thorax which may be so much as to exert serious pressure on the lungs; or it may be dry without any fluid. The fluid may become purulent as often happens in pneumonia, tuberculosis, pyaemia, etc., when it is known as *empyema*.

The onset is sudden and preceded by a chill and accompanied with a "stitch," i.e., sharp stabbing pain in the side, which is aggravated on change of position, coughing or deep breathing. There is dry hacking cough which the patient tries to suppress on account of the pain caused by the two inflamed surfaces of the membrane rubbing together. Fever is not high and subsides after a week or so, unless the fluid becomes purulent. The pain disappears when fluid collects and separates the two layers, but the difficulty of breathing increases on account of the pressure on the lungs. The patient lies on the affected side so as to allow free expansion of the other lung. Gradual fall of temperature, good sleep and general improvement are the signs of recovery. When the fluid becomes purulent severe constitutional symptoms, chills, high fever, sweats and weakness set in.

The treatment is to remedy the original condition responsible for it. The patient should remain in bed and take light nourishing diet. Fever, pain, constipation and nausea require symptomatic treatment. Hot fomentations and poultice to the chest, sedative liniment (No. 37) and immobilizing the chest with strips of plaster as for fractured ribs (*q.v.* page 112, Part I) afford relief from pain. Rheumatic patients are benefitted by salicylate of sodium mixture (No. 85). When the accumulation of fluid is excessive and causes embarrassment to breathing it is removed by means of a special tapping instrument. During convalescence the patient should take rest for a prolonged period, have plenty of fresh air and avoid chills. When the fluid becomes purulent it is removed by aspiration, but it accumulates again and requires several tapplings; in chronic cases surgical treatment is necessary.

## CHAPTER IX

### DISEASES OF THE NERVOUS SYSTEM

The diseases of the nervous system are divided into functional, when no apparent lesion is present, and organic, when there is a structural change of the nervous tissue. The important functional diseases are chorea, epilepsy, habit tic, hypochondriasis, hysteria, neuralgia, neurasthenia and drug addiction. The organic diseases are due to inflammation, injury or tumours. Some of the more common diseases are described here.

#### FUNCTIONAL DISORDERS OF THE NERVOUS SYSTEM

**Chorea** or St. Vitus's Dance. It is a disease in which the patient gets involuntary and irregular jerks involving the head, face, trunk and limbs, inco-ordination of muscular movements, weakness and certain mental changes. It is called St. Vitus's dance because during an epidemic in Europe in the 15th century the patients were sent to the chapel of St. Vitus in a village in Alsace for cure. It attacks mostly children between the ages of five and fifteen, and girls more often than boys. Pregnant women are also liable to get it, particularly in the early part of the first pregnancy. It is a disease of civilized races and town dwellers, primitive people and villagers being particularly immune. It sometimes follows rheumatic fever. Heredity seems to play some part in its production as it is often found in many members of the same family. Fright, strong emotional shock or an injury might bring on an attack, or a relapse if the patient had suffered from it before.

The onset is fairly rapid and often accompanied with low fever. The twitching and jerky movements of the face produce grimaces; those of the tongue and lips interfere with the speech which is mumbling, interrupted and indistinct, while the weakness and jerks of the hand and fingers prevent him from picking up things which are upset or dropped. More prominent among the mental changes are irritability, emotional outburst, maniacal excitement, inability to concentrate the mind and dullness. In pregnant women the mental disturbances are more marked and persistent. The duration of the disease is from six weeks to as many months; in rare cases it becomes chronic, and in pregnant women it may end fatally from complications during labour or abortion.

Chronic chorea of adults is a separate disease which begins about the age of 40, is progressive and incurable, though occasional temporary improvement takes place under treatment. It is hereditary and many members of the same family and many generations in succession are affected by it.

Absolute rest in bed is essential in the treatment of chorea, as also complete freedom from mental or emotional excitement. Any septic condition in the nose, throat or mouth requires prompt attention. Sedative or hypnotic drugs are given only when sleep is disturbed and

not too frequently. Five to ten grains of chloral hydrate may be given according to age an hour before bedtime. Arsenic has a beneficial effect in chorea; to start with 1 minim of Fowler's solution (solution of arsenic) is given thrice daily in a little water after food and the dose gradually increased to 5 minims. Arsenic is not to be continued for more than a week or ten days without an intermission of four days, as it is a cumulative poison and is likely to produce chronic poisoning. Cod liver oil and tonics are also given with arsenic.

**Dipsomania** or Chronic Alcoholism. By this term is meant a persistent and irresistible desire for alcohol. An occasional drinking bout, though not quite harmless, is not likely to have any permanent injurious effects on the mind or body, but if too frequent, it weakens the will and may ultimately lead to dipsomania. Persistent and irresistible craving for alcohol or narcotic drugs is invariably due to some psychical disturbance brought on by unhappy circumstances, unpleasant surroundings, some frustration or suppressed memory of an unpleasant experience from which the psyche, whose constant pursuit is happiness, desires to escape. Dipsomania is therefore a disease of the mind and requires great care and understanding for its cure as is required for any bodily illness; mere deprivation of alcohol is not likely to do away with the morbid craving, but is likely to lead to drug addiction, some other excess, or to some serious mental trouble. In India alcoholism is common mostly among artisans, mill hands and those whose work involves much monotonous physical exertion, and who are always underfed and do not get a balanced diet which is necessary for the preservation of physical as well as mental health and general well-being. They live in over-crowded, insanitary houses and have no source of amusement or recreation to satisfy the inner craving for happiness, and alcohol is the only means of escape from their unhappy condition.

In persons in better circumstances, who take to alcohol, the craving is due to some deep-seated psychological cause, such as domestic unhappiness, some unpleasant experience, or frustration. Over-indulgence in alcohol is an attempt of the sub-conscious mind to abolish the memory of such a disagreeable experience from the conscious mind. Most of these patients die of chronic alcoholic poisoning or some drug addiction unless they receive suitable treatment, or if they are suddenly deprived of alcohol, they get delirium tremens or some mental derangement. Chronic dipsomaniacs are liable to suffer from a progressive kind of insanity with delirium and hallucinations, called *paranoia*.

The first essential for the rational treatment of dipsomania is the realization of the fact that it is a psychological disturbance of the mind caused by certain unhealthy physical and mental conditions preying on the patient's mind and unless these are remedied there is no likelihood of a cure. Mere prohibition by law and punishment of drunkards cannot do away with the cause of drunkenness, nor can it prevent them from obtaining illicit alcohol, which is so easy to manufacture, or from taking to more harmful drinks and drugs, as happened in America during prohibition which had to be abandoned because cases of chronic alcohol poisoning and addiction to cocaine and morphine were on the

increase.

The mass treatment for dipsomania in working class people requires the same understanding and care as in individual cases and consists in removing the unhealthy conditions of the mind and body which drive them to seek temporary relief in short forgetfulness induced by alcohol. This can be done by providing them with sanitary houses and means of healthy recreation by way of games, tea rooms, milk bars, cinema and clubs where they can meet their friends in cheerful surroundings, forget the monotony of their occupation and recover from the physical and mental fatigue. The provision of evening classes for the spread of literacy and for teaching them domestic economy and other interesting subjects will provide them with healthy mental occupation; this with direct and indirect propaganda against drunkenness from the platform and on the screen will not only wean a large number of chronic addicts, but will prevent others from taking to alcohol for recreation.

Individual cases are best treated, when circumstances permit, in an institution specially organised for the treatment of the inebriate where every case is studied with a view to detect the underlying cause and apply suitable treatment. Unfortunately in India such institutions are conspicuous by their absence. Very often when the cause is brought out from the unconscious mind, and explained to the patient this harmful mode of seeking relief is abandoned, especially if cheerful company, healthy physical exercise and interesting mental occupation are supplemented. A cure is sometimes effected, especially in early cases, by mixing some nauseating drug in the drink without the knowledge of the patient, which will make him very sick after partaking of it. If this is done several times at irregular intervals, a dislike for alcohol is developed. The drug commonly used is ipecacuanha wine or apomorphine which has no appreciable taste in strong drinks. Some patients, when they get disgusted with one kind of drink, resort to some other alcoholic beverage or soon learn the trick played on them and take precautions against it.

**Epilepsy** (Falling sickness). Epilepsy is a chronic disease characterised by recurrent attacks of convulsive seizures at irregular intervals with unconsciousness. When the attack is of a short duration with momentary loss of consciousness without convulsions it is called *minor epilepsy* (*petit mal*), but when there are convulsions and unconsciousness lasting for some time it is called *major epilepsy* (*grand mal*). In some few patients a group of muscles are involved, or the general convulsions begin in the same set of muscles; it is then called *Jacksonian epilepsy*, which is due to an injury or disease of the brain. Epilepsy commonly commences in childhood and is rare after the age of twenty. Heredity seems to have some influence in its production, as it is often found in some members of the same family with insanity. Children of chronic alcoholic or syphilitic subjects get it more frequently than others.

The attack comes on suddenly and the patient falls down unconscious, often with a cry and is likely to hurt himself. Occasionally there are

some premonitory or warning symptoms just before the seizure, which are known as aura. This may be in the form of a flash of light, a bright spark of different colours, whistling or ringing noises, peculiar taste in the mouth, strong smell or a creeping sensation from the stomach to the throat. The body becomes stiff, head is turned to one side, limbs are twisted, eyeballs turned and the face is blanched. This is soon followed by convulsive spasms which are mild at first but become violent and involve all the muscles of the body. Clear or blood-stained froth comes out of the mouth, the tongue is protruded and bitten and sometimes the bladder and the bowels are evacuated. After a few minutes the convulsions cease and the patient recovers consciousness or remains in a state of stupor or sleeps for some time and has no memory of what had happened.

In minor epilepsy the loss of consciousness is momentary while the patient is talking, walking or eating; he suddenly becomes pale, stops in his work, may support himself against the furniture or wall, drop anything that he might be holding or may be momentarily confused in mind. After a major attack there may be severe headache, physical exhaustion, aches in the limbs, mental excitement, maniacal attacks during which he might harm himself or others, or in women hysterical manifestations. In many old standing cases there is moral and mental deterioration which appears as addiction to alcohol or drugs, aimless wandering, irritability, moral turpitude and finally insanity.

The treatment of epilepsy resolves itself into the management of the patient during an attack and the treatment during the interval for preventing the attacks or reducing their frequency. Nothing can be done to cut short a seizure and all that is required is to watch him and prevent him from being injured. He should not be removed from the place unless he is lying in the middle of the road. The tongue is protected from being bitten by the insertion of a piece of wood or some other substance between the teeth. All clothing round the neck and chest should be loosened and the froth cleared from the mouth. He should not be disturbed after the attack if he is in a state of stupor and no water thrown on his face as is usually done. In some patients the seizure can be arrested by the inhalation of nitrite of amyl as soon as the premonitory symptoms begin. Hot tea, coffee or diluted alcohol might be given after he gets over the stupor.

In the intervals the patient should lead a quiet life, take light diet, keep regular hours, avoid fatigue and keep the bowels open. Fat should be strictly limited in the diet. Fasting treatment has been found to be beneficial in some cases. The patient is kept on water in which a little salt has been dissolved for ten to fifteen days and the fast is broken by sipping a little fruit juice or barley water sweetened with a little glucose. The normal food containing very little fat is restored gradually.

Many proprietary remedies have been recommended from time to time for the cure of the disease, but so far no drug is known to possess any specific effect on the disease. Bromides in increasing doses have been extensively used and in a large majority of cases they reduce

the frequency and severity of the attacks. Bromide of sodium in 10 to 15 grain doses is given thrice a day in a little water and the dose gradually increased until a total of 60 grains per day is reached. Luminal,  $\frac{1}{2}$  to  $1\frac{1}{2}$  grains according to the age of the patient, is also found beneficial. Various gland extracts, such as thyroid, parathyroid, pituitary have been used with or without bromides with benefit in some cases.

**Habit Spasm.** Habit spasm is an involuntary constantly recurring spasm, usually in the face, head, neck or limbs and is met with in children of a neurotic temperament and sometimes in adults. It produces winking, drawing the mouth to one side, suddenly turning the head, sucking the lips, sniffing, shrugging the shoulders or other similar movements. The patient can control it for a short time when his attention is drawn to it but it soon recurs. It is absent during sleep if it is not due to some lesion of the brain. In some cases it is the result of some local cause, such as an obstruction in the nose, some eye trouble, etc., but the habit might continue for some time after the cause is removed. The trouble usually disappears when the child grows up and no special treatment is required for it, except to draw the child's attention to it without scolding or fear of punishment and encourage it to control the movement as much as he can.

**Hypochondriasis** (Mental Depression). It is a chronic condition in which the patient has a morbid anxiety about his health and constantly worries over trifling symptoms which are exaggerated and attributed to some serious disease; although the most careful medical examination fails to detect any abnormal condition, yet the patient's anxiety cannot be allayed. Slight palpitation of the heart suggests heart disease, disturbance of digestion points to cancer, constipation to obstruction or cancer of the bowel, or headache to a tumour of the brain. His attention may be constantly riveted to the sexual organs on account of the fear of losing his potency. He is morose, unable to concentrate his mind on any serious subject and is afraid of losing his memory. The trouble might have originated in some slight derangement of digestion or some other minor ailment. The trouble may become chronic and persist for life with occasional remissions, or under proper treatment it might disappear altogether. Obstinate cases with hereditary neurosis might terminate in melancholia or suicide.

An important part of the treatment is to remove any minor ailment that might be present and to encourage the patient to follow some healthy pursuit so as to forget his trouble. Light diet, open-air exercise, cold bath, massage, tonics and a cheerful company are all that is necessary. He should be persuaded to take up some interesting hobby to occupy his mind and prevent him brooding over his trouble. Direct and indirect suggestions about his health are very useful.

**Hysteria.** It is a functional nervous disorder which, on account of the great diversity of symptoms presented by it, is difficult to define. It might be described as a state of psychic disturbance with a lack of control over emotions, undue sensitiveness to suggestions and auto-suggestions, deranged sensory and motor functions, morbid self-con-

sciousness and perverted behaviour. The word is derived from Greek *hystera*, meaning the womb, as it was formerly supposed to be caused by disorders of the womb; but it is not solely confined to women, though more common among them than men. It occurs mostly during puberty and early adolescence. Hereditary tendency is the most important predisposing cause and signs of other neurotic conditions, such as neurasthenia, excessive suggestibility, dipsomania, addiction to drugs and insanity may be noticeable in parents or other members of the family. The disease is practically confined to civilized people, some races being more prone to suffer from it than others.

Among the immediate causes that bring on an attack are a sudden mental or emotional shock, prolonged mental strain, injury or disease of any part of the body, addiction to drugs or close association with a person suffering from it. Mass hysteria sometimes develops in a nation or a group of persons living or associating together, as in schools, convents, barracks or in religious gatherings. Although heredity is an important factor in its production, its effect can be modified considerably for the better by proper training of the child.

The symptoms of a fully developed case of hysteria are many and varied, so much so that any disease may be simulated and mistakes in diagnosis are liable to occur unless the case is carefully studied. In a large majority of cases certain symptoms are characteristic, such as emotional instability, a choking feeling in the throat as if a ball were rising in it (*globus hystericus*), loss of sensation in the skin and muscular power in the limbs. Constant headache, loss of vision or hearing, noises in the ears and neuralgic pains may also be present. There may be some tender spots on the body, especially the lower part of the abdomen, which, when pressed, produce pain and faintness and may bring on a paroxysm. These spots are known as hysterogenic spots. The visceral symptoms are referred to the heart, lungs, stomach or bladder. There may be palpitation, faintness, dry cough, rapid breathing simulating asthma, perverted appetite (*pica*) and retention of urine or frequency of micturition. In rare cases food is persistently refused with fatal result, but as a rule in many cases of reported starvation for prolonged periods, deception has been practised and food in some form is taken surreptitiously. It should be noted that all the symptoms described above are not present in every case; usually the psychic symptoms predominate.

It is not difficult for an experienced observer to diagnose hysteria although it simulates many diseases. The loss of muscular power may be mistaken for paralysis, vomiting and pain in the abdomen simulate some serious abdominal trouble, or some really serious complaint in a neurotic subject, who is in the habit of exaggerating her symptoms, may be mistaken for hysteria.

Unless the case is taken in hand early and treatment carried out regularly and intelligently it is apt to run a chronic course. Even when the most troublesome symptoms are abolished, it is difficult to remove the underlying tendency and an acute disease, sudden shock or any depressing condition is likely to bring on the same or some

other manifestation of hysteria. Early cases among young patients may be completely cured or the worst symptoms kept permanently under control by proper treatment, but patients, who are pampered and injudiciously handled by sympathetic but ignorant parents who are themselves neurotic, are likely to become incurable or insane. Death seldom results from hysteria and many hysterical persons go through life without any serious disability.

The most essential condition for the successful treatment of hysteria is the removal of the patient, as soon as possible, from the surroundings and the home influence in which the trouble has developed. She should be isolated in a nursing home away from too sympathetic relatives, and looked after by strangers. The treatment, which has been very successful, is known as Weir Mitchell, after the physician who devised it. The patient is isolated with complete rest in bed for six weeks during which time she is fed liberally and given massage, cold baths and helpful suggestions. After this she is allowed to get out of bed and the food is reduced to the normal quantity. She is encouraged to take up some occupation in which she is interested, such as drawing, painting, music, games, etc., to keep her mind occupied and make her forget her trouble. Hydro-therapy, electric treatment, outdoor exercise and tonics are beneficial. Paralysis disappears suddenly or gradually under electric treatment, passive movements or suggestion. An electric shock or a serious suggestion that a surgical operation or the application of hot iron is necessary, will bring about a rapid cure. Hysterical convulsions are relieved by cold water on the head or smelling salts to the nostrils.

It is necessary for the parents and relatives to be acquainted with the nature of the disease so that they might treat the patient with firmness, avoid any excessive exhibition of sympathy and kindness, enforce regular habits and train the child to control her emotions. Unfortunately, the parents themselves are, very often, neurotic or hysterical and incapable of bringing up their children.

**Neuralgia.** The term neuralgia is applied to paroxysmal or intermittent attacks of pain of a shooting, stabbing or burning character radiating along the course of a nerve without any apparent cause, or if one is present it is at a distance from the site of pain. It is practically absent in children but is common in young persons. It is very often found in persons with a gouty or rheumatic tendency or those suffering from malaria, influenza, diabetes, syphilis or mental strain. It may occur in any part of the body, but the face, intercostal spaces, thighs, testis in the male and the breast in the female are more frequent sites. The pain comes suddenly from some slight cause, such as a draught, etc., or without any cause and increases in intensity until the climax is reached within a few minutes or hours, after which it subsides suddenly or gradually. It may recur after an interval of a few minutes, hours or days. An attack is sometimes followed by a painful eruption of shingles. The neuralgia is known according to the nerve affected, e.g., facial, supra-orbital, dental, intercostal, mammary, sciatic, genital, etc.

Facial or trigeminal neuralgia, also known as *tic douloureux*, affects the nerve of the face, which has three branches, hence the name. Ordinarily one, sometimes two and less commonly all three are involved. The attacks last from a few seconds to five minutes and are characterized by excruciating pain of a shooting, stabbing or burning nature and are provoked by washing or touching the face, eating or drinking, a cold draught or often without a cause. It is felt on one side of the face, radiates to the forehead and lower jaw and after lasting for some time leaves the patient free for a few days or weeks, but the intervals get shorter and shorter until it becomes more or less constant.

The medical treatment of this disease is very disappointing. Sedative drugs, such as aspirin (No. 135), pyramidon 5 grains, or butyl chloral hydrate with tincture of gelsemium (No. 66) taken three times a day might mitigate the severity of the attack. These drugs should not be continued for long. Electric treatment, viz., ionization with salicylate of sodium, sometimes gives relief, but in a large majority of cases it becomes necessary to resort to surgical treatment, which consists, either in injecting alcohol deep into the nerve trunk, which, if successful, removes the trouble for six months or so, or in a major operation to resect the root of the nerve in the skull. During a severe paroxysm it may be necessary to give a subcutaneous injection of morphine, but this should be avoided as much as possible, as morphine is a dangerous habit-forming drug, weakens the mental faculties and with frequent use loses much of its sedative effect.

Dental neuralgia is a very painful trouble. The erosion of the enamel of a tooth exposes the sensitive dentine, which is a good conductor of heat and the pain is brought on by hot or cold drinks, sweet foods or pressure on the exposed dentine. In every case of dental neuralgia an investigation by a dentist is necessary. The pain is relieved for the time being by aspirin powder (No. 135).

In occipital neuralgia the pain is felt on the back of the head and the scalp over it is tender. The trouble disappears under treatment but has a tendency to recur.

Intercostal neuralgia affects the nerves running in the interspaces between the ribs. An attack is often followed by shingles which is very painful.

Sciatica or sciatic neuralgia is a chronic and very painful affection of the sciatic nerve which runs along the back of the thigh. It attacks males between 30 and 60 more often than females. It may be due, in some cases, to a septic focus in the body, an old injury of the pelvis, exposure to cold, rheumatism or chronic gonorrhoea. The pain is of a burning, gnawing or aching character and is felt in the buttock, back of the thigh, leg and heel. In the beginning it is intermittent but becomes continuous and may be so severe as to incapacitate the patient from work. Sciatic pain is sometimes caused by the pressure of a tumour on the nerve trunk in the pelvis. Mild and recent cases recover completely with rest and treatment, but the chronic ones are obstinate and tend to recur. In all cases a thorough investigation is necessary so as to find the cause before undertaking treatment. Pain is relieved

for the time being by aspirin powder, but if it is very severe hot applications or an ice-bag on the course of the nerve will be beneficial. Rheumatic patients are benefitted by iodide of potassium and salicylate of sodium (No. 86). In persistent cases it becomes necessary to resort to surgical measures which consist in injecting the nerve trunk with saline solution, stretching the nerve frequently by flexing the thigh on the abdomen with the leg extended while the patient lies in bed, or exposing the nerve and stretching it with the hand. Temporary relief from pain is obtained by injecting a few drops of a  $\frac{1}{2}$  to 1 per cent solution of novocaine into the nerve trunk.

**Neurasthenia.** The term neurasthenia, meaning weakness of nerves, is applied to a chronic condition of fatigue of the nervous system, characterized by lack of energy, abnormal fatigability, a state of constant anxiety, sleeplessness, digestive disturbances and pain in the back and limbs. Hereditary weakness of the nerves is an important factor in its production, but under the strain of modern civilized life involving constant expenditure of physical and mental energy even the strongest are liable to succumb to it. There may be an exciting cause, such as an acute infectious disease, chronic indigestion, prolonged worry, overwork, emotional disturbance, addiction to alcohol or drugs and sexual excess. Easily suggestible persons with an unstable nervous system, who have been reading advertisements by quacks suggesting the most horrible diseases produced by self-abuse or sexual excesses, are easy victims. The unfortunate person imagines himself suffering from all such diseases described in the advertisement. The publication or circulation of such advertisements should be prohibited by law.

A sudden shock or a shaking received in a railway or motor car accident, even without much apparent damage to the body, is often the starting point of a prolonged or lifelong trouble. The so-called *shell-shock* is a variety of the disease which is often aggravated and becomes chronic by the excess of care and sympathy shown to the war-weary soldier, especially if he has a hereditary nervous weakness. In such cases there may or may not be some physical injury.

The disease presents many symptoms all of which are not found in every case; these are modified according to the nature and temperament of the patient. Of the mental symptoms, inability to concentrate the mind and mental fatigue are prominent. The patient is irritable, self-conscious and suffers from sleeplessness which is a great source of anxiety and may make him a drug addict. Loss of appetite, indigestion, headache, palpitation, pain in the back and limbs, spots before the eyes, noises in the ears, giddiness, frequent micturition and tremors in the limbs are among the common symptoms. Many patients have fears or phobias which are given special names, such as *claustrophobia*, the fear of closed spaces; *agoraphobia*, the fear of open spaces; *monophobia*, the fear of being alone; *anthropophobia*, the fear of human society; *pathophobia*, the fear of catching disease; *astrophobia*, the fear of lightning, etc. The fear is unreasonable and groundless and many patients recognise the absurdity of it, yet they are unable to overcome it. In some few cases it is possible to determine the underlying cause

by psychoanalysis. Some trivial shock or a psychic injury received in childhood by a sensitive child may be the hidden cause of the trouble in the adult and if this is brought to the conscious mind by psychoanalysis, the trouble might disappear without any other treatment. Neurasthenia of sexual origin manifests itself in irritability of temper, shyness in the presence of women, frequent emissions at night and during the day, premature ejaculations, imperfect erection, dread of impotence and genital neuralgia. In the female there may be irregular and painful menstruation. In short, there is a variety of symptoms without any organic disease, and a state of general apprehension dominates the mental condition.

Neurasthenia, though a chronic and often an obstinate complaint, is amenable to treatment and all cases can be cured if properly treated. Some require prolonged attention and have a tendency to relapse, especially if the patient is subjected to the same conditions that brought on the first attack. The progress towards recovery may be interrupted and there may be temporary setbacks, the patient is therefore warned not to worry on that account. A thorough medical examination is necessary, as soon as the condition is recognised, so as to find out any abnormal physical condition or mental trouble that might be present. Faulty habits of mind or any morbid ideas require correction. A daily routine of some light work, in which the patient is interested, is arranged to occupy his mind without producing undue fatigue, with intervals to allow complete rest and relaxation. He should be encouraged to take part in outdoor games and should have plenty of sleep at night and rest in bed in the afternoon. The diet should contain milk, butter, cream, eggs, green vegetables and fruit. Any special diet or dieting for weight reduction is not advisable. Alcohol is to be avoided, as, in such cases, alcoholic habit is easily formed. Sleeplessness can be easily overcome provided the patient does not worry about it and does not take any sedative or narcotic drugs which might induce sleep in the beginning but soon lose their effect, become dangerous by weakening the mind and retard recovery. Glycerophosphates taken after food are useful in toning the nervous system. Ready-made preparations of these are available in the market and should be taken according to instructions on the bottle. Patients with obsessions and phobias are benefitted by psychoanalysis. A complete change of scene and occupation is advisable in chronic and obstinate cases.

**Shaking Palsy** (Paralysis Agitans). It is a chronic disease of the nervous system characterized by tremors, rigidity and weakness of muscles. It is met with in old persons and is rarely seen before forty-five. In most cases no cause is known, but sometimes a hereditary tendency, prolonged anxiety, physical injury or an acute infectious disease can be attributed as the cause. The onset is very gradual and the progress slow. The chief symptoms are tremors of the limbs, stiffness and weakness of muscles. The tremor is rhythmic and commences in one hand, the fingers being affected first, it then spreads to the whole limb, then to the opposite side and finally to the lower limbs. It may also affect the head and neck. It persists throughout the day when

the patient is awake and stops during sleep. On account of the rigidity of the muscles the head and trunk are bent forward, the face has a fixed anxious expression and the knees and hips are flexed. If the patient is pushed backwards he is unable to stop until his progress is arrested by an obstacle. The mental faculties are not affected except as the result of senility. The disease is incurable but it is not directly fatal.

### ORGANIC DISEASES OF THE NERVOUS SYSTEM

These are many and varied, some are very rare. These are due to inflammation, suppuration, degeneration caused by arterial disease, tubercle, syphilis, tumour or injury. Heredity is responsible for many nervous diseases. Some of the more commonly met with are described here.

**Neuritis.** Inflammation of a nerve is called neuritis which may be acute or chronic. It is called localized when a single nerve or a set of nerves is involved and multiple or polyneuritis when several nerves in different parts of the body are affected. The former is caused by a direct injury, constant pressure, as from a badly fitting crutch in the armpit, or chronic metal poisoning. The pain of neuritis is boring, burning or aching in character with occasional lightning-like flashes. When a motor nerve is affected the muscles controlled by it are paralysed and atrophied. When a sensory nerve is involved sensations of pins and needles or burning are felt and there is loss of sensation in the area of the nerve.

The facial nerve controlling the muscles of the face is often affected from exposure of one side of the face to cold, especially in rheumatic subjects. The muscles on one side of the face are paralysed and the patient is unable to close the eye, blow or whistle as the air escapes from the paralysed side of the mouth which hangs lower than the healthy side. The condition is known as *facial paralysis*. The same result is produced when the nerve is accidentally injured during an operation near the angle of the jaw. In chronic lead poisoning the muscles extending the hand are paralysed producing what is called *wristdrop*. The treatment consists in finding and removing the cause. In case of a direct injury and severance of a nerve surgical treatment is necessary to bring together and unite the ends. The pain may be relieved by aspirin powder (No. 135) taken internally or by hot applications or counter-irritants, such as strong tincture of iodine, mustard plaster, etc., along the course of the nerve.

Multiple neuritis is due to some abnormal condition, such as diabetes, chronic metallic or some other poisoning, chronic alcoholism, beri-beri, diphtheria or some other acute infectious disease. The onset is gradual with slight fever, numbness and tingling in the limbs, increasing weakness and pain. The symptoms increase in intensity for the first month or so, the muscles become thin, the movements are inco-ordinated and the patient is unable to walk and is confined to bed.

If the cause is removed before the disease has advanced too far and proper treatment taken, the symptoms slowly diminish in severity

and complete recovery might take place in course of time, but if the case is neglected the patient dies of some intercurrent disease. The next in importance is the improvement of the general health. Rest in bed during the acute stage, light exercise when the condition permits, avoidance of alcohol, nourishing diet with cod liver oil, fresh vegetables and fruit, vitamins, iron and other tonics are indicated. Free sweating is beneficial which is induced by hot baths and hot packs. Aspirin powder (No. 135) occasionally administered is useful in relieving the pain. Regular gentle massage and electric treatment are given to stimulate the circulation in the muscles and prevent their atrophy. When one set of muscles is paralysed as in wrist or footdrop, the limb is supported by splints so as to prevent the opposite set of muscles from contracting and permanently overstretching the affected ones. In favourable cases improvement is seen after a couple of months.

### DISEASES OF THE SPINAL CORD

The spinal cord is subject to a variety of diseases many of which are rare. They are mostly inflammatory or degenerative in character due to arterial disease, tubercle, syphilis or as a complication of acute infectious diseases.

**Spinal Myelitis.** It is an inflammation of the spinal marrow and is not a common disease, but is met with as a result of injury to the spine, syphilitic disease, septic infection, tuberculosis of the spine, gonorrhoea or chronic carbon monoxide poisoning. The onset is usually rapid but may be gradual and the extent, severity and persistence of the symptoms depend on the extent of the lesion and the level at which the cord is affected. The patient has increasing weakness in the legs which may spread to the upper limbs, hypersensitiveness, pain, tingling and numbness. The weakness becomes so great that the patient is confined to bed. There is retention or incontinence of urine and faeces on account of loss of sensation and power in the bladder and rectum. If the lesion is situated high up death may take place within a few days. In some cases there is a sensation of constriction as if a tight band were tied round the body which is called "girdle pain". Under treatment some cases, especially mild ones, get well but a large majority of them end fatally from septic infection of the bladder and kidneys, bed-sores, respiratory complications or some other intercurrent disease.

The treatment consists in removing the cause as much as possible, treating the symptoms and careful management of the patient so as to prevent the development of complications. Precautions against bed-sores are very necessary, as on account of the loss of sensation and trophic changes in the skin they are very liable to occur and become septic very easily. The heels also require constant watching as the pressure against the bed may cause troublesome sores. The urine has to be regularly drawn under strict precautions against infection of the bladder and kidneys which is rapidly fatal. Hot applications and counter-irritation are applied to the spine for reducing the inflammation and gentle massage and electric treatment to the muscles to retain their tone.

**Locomotor Ataxy** (Tabes Dorsalis). This is a chronic syphilitic disease of the spinal cord which appears years after the infection. In children it is due to inherited syphilis. It is characterized by inco-ordination of muscles, loss of power, sensory disorders and visceral disturbances. Its symptoms are pain, ataxy, i.e., unsteady gait, wasting and loss of power of muscles, visceral crisis, disturbed function of the sphincters, sensory disturbance and, finally, paralysis. The pain, which is severe and of a burning, shooting or gnawing character, is the first symptom and is felt in the legs and lasts for hours and recurs after a short remission. The inco-ordination first involves the legs and may extend to the hands also. It is first noticed when the patient walks in the dark or climbs steps. While walking the legs are thrown up and brought down with a jerk. He is unable to maintain his balance while standing with his feet together and the eyes shut. The sensory symptoms are warmth, tingling, hypersensitiveness or loss of sensation.

The visceral crisis mostly affects the stomach, but may occur in the bladder, rectum or larynx. In gastric crisis there is severe abdominal pain, sometimes with vomiting. In rectal crisis pain, diarrhoea and straining are present and in the larynx there is difficulty of breathing with cough. The joints may be affected, the bony ends are enlarged and the ligaments softened. The disease may progress rapidly to a fatal termination or it may drag on for years.

The success of the treatment depends on the early recognition of the condition and adopting suitable measures. It may not be cured completely but its progress can be arrested and the patient enabled to lead a fairly active and comfortable life. Plenty of rest, as much fresh air as possible, nourishing diet containing milk, fresh vegetables and fruit, avoidance of alcohol, physical and mental fatigue and excess of every kind are a necessary part of the treatment. For pain in the limbs aspirin powder (No. 135) and electric treatment are beneficial, for the visceral crisis sedatives and morphine subcutaneously may be necessary. Several exercises have been devised for the treatment of ataxy which, if followed regularly, are very useful. In the early stages, anti-syphilitic treatment will not only arrest the progress but may cause complete disappearance of the symptoms.

**Acute Ascending Paralysis** (Landry's Paralysis). It is an acute disease in which paralysis commences in the legs and soon spreads to the trunk, arms and muscles of the chest ending in death within a few days. It attacks young persons usually after an attack of influenza or some other acute infectious fever. The onset is marked by pain in the back and legs, slight fever and sometimes numbness and weakness in the legs. This is soon followed by complete loss of power which spreads upwards to the trunk, arms, respiratory muscles and throat. Death takes place in about a week's time from respiratory failure. Some few cases survive for a month or so and fewer still recover gradually after a year or two. There is no treatment that is likely to do any good and the patient is kept at rest, fed regularly and generally looked after.

**Chronic Progressive Muscular Atrophy.** This is a chronic disease in which there is progressive wasting of muscles commencing in the small

muscles of the hand and spreading gradually to those of the forearm, arm, shoulder, neck and chest. In rare cases it commences in the muscles of the shoulder. The disease may last for 10 or 15 years until the patient dies of some intercurrent disease. It is a disease of young adults and is rare before the age of twenty. There is no treatment known which is likely to arrest the progress of the disease. The patient is kept at rest, fed regularly and given hot baths, massage and electric treatment to maintain the tone of the muscles as much as possible.

**Spastic Paralysis.** It is a chronic disease, usually attacking young adults, in which there is progressive weakness of the legs followed by stiffness and difficulty of locomotion, the patient dragging and crossing the legs while walking. The cause is not known and there is no treatment for the disease which lasts for years. A similar kind of spastic paralysis occurs in several children of the same family and for several generations which is known as hereditary ataxy. It commences in childhood, involves the legs first and extends to the upper limbs, head and trunk. If it commences early the child does not learn to walk or loses the ability to do so if it occurs later. The disease is progressive and death takes place from an intercurrent disease, there being no treatment for it.

**Progressive Bulbar Paralysis.** It is a rare chronic disease of the bulb (Medulla Oblongata) which is the uppermost part of the spinal cord situated in the cranial cavity. In it are located the motor centres for the tongue, throat, palate and larynx which are gradually paralysed. It is a disease of advanced age and is very rare before 45. The tongue is the first part to be attacked, then the lips with the result that the patient has difficulty of speech which, in time, becomes nasal and unintelligible. As the disease progresses there is paralysis of the tongue which causes difficulty of swallowing and dribbling of saliva from the mouth. All the symptoms get progressively worse and the patient dies in three years' time from exhaustion or septic pneumonia caused by food drawn into the air passages. There is no satisfactory treatment for the disease.

#### DISEASES OF THE BRAIN AND ITS COVERINGS

**Cerebral Meningitis.** The term is applied to an inflammation of the coverings of the brain, of which there are three, the outer tough and parchment-like is known as dura mater; the middle arachnoid and the inner pia mater are thin and delicate. The inflammation of the dura mater is called pachymeningitis, while that of the inner two is called leptomeningitis. There are several varieties of acute and chronic meningitis depending upon the kind of infective micro-organism, i.e., suppurative, tubercular, syphilitic, etc.

Pachymeningitis results from septic infection spreading from a fracture of the skull or from suppuration in the middle ear. The onset is usually rapid and the patient feels dizzy, has headache, stiffness of the neck and sometimes convulsions. The condition is less serious than leptomeningitis and the patient may get over it with proper treatment.

Leptomeningitis is a dangerous disease and may cause death within four or five days. It is often a complication of suppuration in the middle ear, scarlet fever, typhoid, erysipelas, pyaemia or some other acute infectious fever. Tubercular variety results from an infection from a tubercular focus in the body and runs an acute course. When it occurs in the course of an acute disease the onset is insidious and the symptoms may not be noticeable for some time, otherwise it comes on suddenly. The patient has severe headache, restlessness, irritability, stiffness of the neck and retraction of the head, delirium and stupor. The headache is very severe with occasional exacerbations when the patient screams even when he is unconscious. The disease is dangerous and before the introduction of sulpha drugs and penicillin few patients recovered.

The treatment includes complete rest, careful nursing, regular feeding, ice-bag to the head and early administration of sulpha drugs or penicillin.

**Encephalitis.** It is an acute inflammation of the brain and is met with under different conditions. It may be the result of an injury to the skull, in which case it is localized. It may occur as a complication of some acute infectious disease, such as influenza, measles, diphtheria, scarlet fever, typhoid, pneumonia, erysipelas, septicaemia or syphilis. The onset is sudden which may be preceded by headache, general malaise, lack of energy, irritability and sometimes convulsions. The temperature may reach 105. There may be stiffness of the neck in the beginning. If the motor area of the brain is involved there is paralysis of the corresponding part of the body.

Many patients with a mild attack recover, but the outlook is not hopeful if the symptoms are severe with high fever, deep coma and difficulty of breathing. The treatment includes rest in bed in a quiet dark room, careful nursing, ice-bag to the head, hot foot bath, leeches to the back of the neck, frequent saline purgatives and administration of salicylate of sodium, 10 to 15 grains four times a day and sedatives for headache and restlessness.

**Abscess of the Brain.** Suppuration in the middle ear is the most frequent cause of abscess of the brain. An injury of the skull, erysipelas of the scalp, suppuration in one of the sinuses in the face bones or an infection from a suppurating focus in the body are among the other causes. When due to an extension from the ear or an injury it is solitary but when due to an infection brought from some part of the body it is often multiple. The symptoms are headache, fever, malaise, want of appetite, vomiting and when the abscess bursts into one of the cavities in the brain, sudden rise of temperature, delirium, convulsions, stupor and death. If the abscess is small and the case is recognized early an operation to let out the pus affords the best chance of recovery.

**Hydrocephalus** (Water in the Head). By hydrocephalus is meant an abnormal accumulation of fluid in the ventricles, i.e., the cavities in the brain. Normally, a certain amount of cerebro-spinal fluid is secreted in the ventricles which gets absorbed into the minute blood

vessels on the surface of the brain, but when for any reason, such as inflammation, injury, etc., the absorption is hindered it accumulates and forms hydrocephalus. The condition may be congenital and develop during the intra-uterine life or soon after birth; in the former case the size of the head may be so large as to cause serious obstruction to labour. In infants the enlargement of the head is the first sign to attract attention. The sutures, i.e., the gaps between the different bones of the skull, open out and the fontanelles widen and do not close. For a time the child has no other trouble and may be bright, but sooner or later suffers from malnutrition, the limbs become thin and wasted, the mind becomes dull and sluggish, the eyesight is affected and finally convulsions and coma supervene which end in death. If the progress is slow the child dies of some intercurrent disease within a few months.

The symptoms in older children and grown up persons are due to an increase in the intra-cranial pressure, viz., headache, vomiting and blindness without any enlargement of the head as all the bones of the skull are firmly united. Convulsions and coma occur before death takes place. There is no satisfactory treatment for the disease.

**Cerebral Softening** (Softening of the Brain). This is caused by occlusion of an artery which deprives the area supplied by the artery of blood supply. This happens when a clot is formed in the artery (thrombosis) or when one is carried to it in the blood stream from a diseased valve of the heart where it is formed (embolism). The former is formed when the wall of a vessel is damaged or diseased. In old age the arterial wall is hardened and the circulation is less vigorous which favour its formation. In younger persons syphilitic disease of the arteries or the valvular disease of the heart is the most common cause. Chronic metallic or carbon monoxide poisoning is also responsible for arterial disease.

In thrombosis there are usually some premonitory symptoms, such as severe headache, giddiness, tingling of limbs on one side, disturbance of speech and memory, mental confusion, dullness of intellect and sleeplessness. In embolism the patient suddenly becomes unconscious without any premonitory symptoms and the subsequent course is the same as in thrombosis. The softening and destruction of the brain tissue produce paralysis of the part of the body controlled by that particular area of the brain. It starts in one limb and in course of time extends so that ultimately the whole side is involved. The severity of symptoms and the extent of the parts involved depend on the extent of damage to the brain tissue. The occlusion of a large artery rapidly ends in death.

The preventive treatment is to put the patient to bed as soon as any of the premonitory symptoms appears. Any underlying cause requires prompt treatment. The detachment of an embolism from a diseased valve of the heart cannot always be guarded against but the patient should avoid sudden efforts, straining at stool or any effort likely to increase intra-abdominal or thoracic pressure suddenly. The subsequent treatment for paralysed muscles is the same as described

under paralysis.

**Disseminated Sclerosis.** It is a chronic disease in which scattered areas of the central nervous system degenerate and produce a variety of symptoms depending upon the extent and the areas involved. The cause is not known, but it is often found in persons who had an attack of an acute infectious disease, chronic metallic poisoning, injury or some severe illness. The earliest and the most common symptom is the weakness of one of the limbs. The patient is unable to hold any article for long if the upper limb is affected, or drags the foot while walking when the lower one is involved. The weakness may extend to other limbs in course of time. Another common symptom is nystagmus, i.e., a constant and involuntary movement of the eyeballs. Other characteristic symptoms are scanning of the speech, tremors of the head and upper limbs, rigidity of legs, sensory disturbances, dullness of mental faculties and irritability of the bladder or difficulty in passing urine. No satisfactory treatment is known for this disease. The symptoms abate for a time under rest. Organic preparations of arsenic do good in some cases.

**Aphasia** (Loss of Speech). Aphasia is a disorder or complete loss of speech which is manifested in various ways. There may be complete loss of power to utter words which are in the patient's mind or which he sees in print, there may be a confusion of speech, the patient using a mixture of words conveying no meaning, there may be an inability to comprehend spoken or written words or all these defects may be present at the same time. Aphasia is usually associated with hemiplegia of the right side as the speech centre is situated, in right-handed persons, on the left side of the brain. The treatment consists in applying remedies to the cause if it is known and re-educating the patient.

**Apoplexy** (Bleeding in the Brain). The term is applied to a sudden attack of unconsciousness caused by bleeding in the brain as a result of increased intra-arterial pressure and degeneration of the arterial wall. It usually occurs after 45, but may occur in younger persons suffering from gout, diabetes, kidney disease, chronic alcoholism or metallic poisoning, high blood pressure, excessive use of tobacco, and syphilis. In some families there is hereditary tendency to bleeding in the brain.

The seizure is usually sudden, but in some cases there are premonitory symptoms, such as headache, giddiness, tingling in the limbs, disturbance of speech and mental confusion. During the seizure the patient is deeply comatose and cannot be roused, the face is puffy, breathing slow, noisy and laboured and the pulse slow and full. The unconsciousness may last for some hours or for several days and the patient may die without regaining consciousness. The signs of returning consciousness are some voluntary movements, quieter breathing and slight rise of temperature. The result of the seizure is hemiplegia, i.e., paralysis of one half of the body, viz., one arm, leg, one side of the face, and tongue. In favourable cases the leg recovers to some extent and in mild ones the paralysis may disappear completely leaving some

weakness in the limbs and a certain amount of mental deterioration. The paralysis of the right side of the body in right-handed persons is often associated with complete loss or some disturbance of speech, as the centre for muscles responsible for producing articulate speech is situated on the left side of the brain in such persons and in left-handed persons the opposite is the case.

Preventive treatment is very important in persons who are suffering from arterial degeneration and high blood pressure. Frequent saline aperients, low diet, avoidance of alcohol, tobacco, spicy food, over-exertion and mental excitement are necessary for such persons. Gout, diabetes, kidney disease and syphilis should receive proper treatment. During an attack the patient should be put to bed with the head elevated and no attempt made to rouse him, the bowels should be cleared with an enema and no food given by the mouth as long as the patient is in deep coma as he is unable to swallow. Nutrient enemata might be given at regular intervals without any stimulant. In full-blooded plethoric patients venesection is useful and about 200 c.c. of blood may be withdrawn, but this is not advisable in thin anaemic subjects. The patient should remain in bed for some days after regaining consciousness even if he is able to get up. During the first week or so it is not advisable to administer any medicine, except mild saline purgatives. After a week gentle massage and passive movements of the paralysed limbs might be commenced. For restlessness and sleeplessness bromides and sedatives are to be given very sparingly. The primary disease responsible for the arterial disease should receive proper treatment.

**General Paralysis of the Insane** (Paralytic Dementia). It is a chronic progressive syphilitic disease of the brain characterised by mental enfeeblement with delusions of grandeur, general paralysis and death. The disease develops in a small proportion of syphilitic patients, particularly in those who are addicted to alcoholic or sexual excesses and in men more often than in women. It attacks persons in prime of life.

In some cases the onset is insidious and progress slow, while in others it is sudden and the symptoms rapidly develop to a fatal termination. In the early stage a change in personality is noticeable as seen in absent-mindedness, carelessness about the dress, forgetfulness, inattention to work, irritability and slowness of comprehension. The patient becomes silly and childish in his behaviour and has occasional emotional outbursts. This is associated with delusions of grandeur, power and strength and the patient acts on these. Some patients have mental anxiety, depression and constant fear of persecution or impending danger. This may alternate with excitement or there may be progressive deterioration in mental condition from the beginning without depression or exultation. As the disease progresses loss of memory, defective judgment, want of will power, difficulty of writing, and defect of speech become apparent. Physical weakness supervenes in the last stages and the patient becomes bedridden and loses control over the bladder and rectum. The paralysis gradually spreads to all parts of the body until the muscles of respiration are involved and

the patient dies of respiratory failure, septic bedsores or other inter-current disease. Occasionally, temporary spontaneous remissions take place in mental and physical symptoms.

There is no satisfactory treatment for this disease and although it is of syphilitic origin anti-syphilitic remedies are ineffective in its treatment as they do not reach the brain cells when injected into the blood. Penicillin seems to act better if used in the beginning. As soon as the early symptoms appear the patient should be relieved of all physical and mental work and given complete rest. He should have plenty of fresh air and nourishing diet. For the last few years artificially induced fever has been tried with some success. For this purpose a small quantity of blood from a patient suffering from benign tertian malaria is injected into the patient's vein, who is allowed to have about twenty paroxysms of fever after which anti-malarial remedies are administered. Relapsing fever induced in the same way acts similarly.

**Paralysis.** By paralysis is meant the loss of power and voluntary control of a limb or a part of the body. The impulse for a voluntary movement originates in the motor area of the brain, from where it is conveyed by nerve fibres to the nerve cells on the opposite side of the spinal cord where it is relaid and conveyed to the muscles through the nerves. If any of these structures, viz., the nerve cells in the motor area of the brain, the fibres from them to the spinal cord, the cells of the cord or the nerves from them to the muscles, is damaged so that the impulse cannot originate in the brain or is interrupted on its way to the muscles, the result is loss of control and paralysis of the muscles. It will be seen that paralysis is not a disease of the muscles but a symptom of some damage to the nervous system and that the cause is not located in the paralysed muscles.

When one side of the body, including the arm and the leg, is paralysed it is called *hemiplegia*. It is due to some damage to the motor area in the opposite side of the brain or nerve fibres issuing from there. The paralysis of both the legs is known as *paraplegia* which is due to a transverse lesion of the spinal cord. *Monoplegia* is the paralysis of one limb, *facial paralysis* is the loss of power in the muscles of one side of the face, and *ptosis* or drooping eyelids is the loss of power in the muscles of the lid. Similarly, *foot-drop* and *wrist-drop* mean loss of power in the extensor muscles of the foot or wrist. In *infantile paralysis* (see Poliomyelitis) a single muscle or a group of muscles is involved. *General paralysis of the insane* (q.v.) is a syphilitic disease of the brain.

The paralysed muscles become thin and wasted for want of use, the wasting being rapid and more marked when the nerves controlling their nutrition, i.e., the trophic nerves, are damaged as happens when the nerve trunk from the spinal cord is severed. When the nerve cells are destroyed they cannot be renovated and the resulting paralysis is permanent, but when the nerve fibres are damaged they grow again under favourable circumstances and the power is gradually restored provided the muscle has not completely degenerated into fibrous tissue in the

meantime.

The treatment of paralysis is naturally directed towards the condition of the nervous system which is responsible for its production. Massage, passive movements and electric treatment are given to the affected muscles so as to keep up their tone and nutrition. In India there are some quacks who pose as "paralysis specialists" and who guarantee to cure any kind of paralysis. Many ignorant patients waste their time and money on them. They have no idea as to the cause and the real site of the trouble and cannot give any rational treatment, their remedy for paralysis being some oil to be rubbed on the affected muscles which cannot have any effect on the damaged nervous tissue.

## CHAPTER X

### DISEASES OF THE URINARY SYSTEM

**Acute Nephritis** (Bright's Disease). By nephritis is meant an inflammatory condition of the kidneys which may be acute or chronic. It is brought on by exposure to cold, especially when the body is wet or when the person is under the influence of alcohol. It is a common complication of scarlet fever, other infectious diseases and acute inflammation of the tonsils, throat, larynx, etc. It is induced by many irritants taken internally or absorbed through the skin. It is often met with in pregnancy and disappears after confinement or it may be followed by eclampsia (*q.v.*).

The onset may be insidious and the patient may not have much general disturbance of health in the beginning. The urine contains albumen (see Urine, page 58, Part I), the quantity of which varies according to the severity of the disease. The early symptom noticed by the patient is a little swelling or puffiness of the face, more marked on waking from sleep. In some cases the onset is sudden with slight fever, loss of appetite, headache, pain in the back, puffiness about the eyelids, and frequency of micturition with scanty high coloured urine of high specific gravity containing some blood in addition to albumen. There may be some swelling about the ankles which, in advanced cases, spreads over the rest of the body and fluid may accumulate in the cavities in the body, but unlike the swelling in heart disease, it is not marked on the pendent parts. Vision is affected and blindness may result, but it passes away with improvement of the symptoms. The mortality rate is not high and most of the patients recover under treatment.

The patient is put to bed and kept warm in a well ventilated room as soon as the symptoms appear. To start with the diet is limited to milk or milk and barley water sweetened with glucose. The total fluid intake should not exceed 3 or 4 pints a day as the excretory function of the kidneys is deficient. The bowels are kept open by saline purgatives so as to remove as much of the waste products from the body as possible through them. When the kidneys begin to function better and the quantity of urine has increased the food is increased by the addition of biscuits, toast with butter, sago and other farinaceous food. The intake of salt and nitrogenous food is to be limited. Hot fomentations and cupping on the loins are beneficial in reducing the inflammation. Diaphoretics, hot packs and steam baths by inducing sweating are helpful in removing the waste products from the body and relieving the strain on the kidneys.

**Chronic Nephritis.** It may be the continuation of an acute attack or may originate insidiously. The patient has general ill-health, digestive disturbances, headache, weakness, loss of weight, pallor of the skin and dropsy, which may be confined to the face and ankles or affect the whole body in severe cases. The urine is usually decreased in amount and contains albumen. The outlook is not very hopeful in such cases. In another variety of chronic nephritis there is little or

no swelling and the quantity of urine passed is profuse with increased frequency so that the patient has to get up at night to pass water. The progress in such cases is slow and although complete recovery does not take place the patient may live for years.

When the swelling is considerable the patient is kept in bed and well protected by warm clothing until the acute symptoms subside, after that he might move about without getting fatigued. The bowels are kept open by saline purgatives. The diet should contain very little red meat and consist of fish, white meat, eggs, rice, sago, oatmeal, skimmed milk and vegetables. The dropsy may disappear with rest, diet and purgatives, but if the swelling is considerable it can be removed by tapping.

**Anuria.** The term is applied to a condition in which there is total suppression of urine which may occur as a result of acute nephritis, complete obstruction to the flow of urine from both the kidneys, or chronic poisoning from lead, mercury or other chemicals. The condition is to be distinguished from retention of urine in which urine is secreted by the kidneys but cannot be expelled from the bladder on account of an obstruction in the urethra. The symptoms of suppression are dryness of the mouth, twitching of the muscles, restlessness and sleeplessness and unless the secretion of urine is re-established uraemia supervenes and death takes place within four or five days. The treatment is applied for the relief of the primary condition and if it is due to an obstruction very early surgical treatment is necessary.

**Uraemia.** The term is applied to a toxic condition brought on by the accumulation of urea and other waste products of metabolism in the blood when not excreted by the kidneys as in anuria (*q.v.*). It may be an acute condition when the suppression of urine is sudden and complete, or it may be chronic when the excretory function is defective. The early symptoms are headache which may be very severe, restlessness, vomiting, diarrhoea, lethargy, difficulty of breathing, and nocturnal delirium. When the condition gets worse, convulsions, exhaustion, drowsiness and coma supervene and death takes place unless the secretion of urine is re-established. The treatment is directed towards the primary condition responsible for it (see also Part I).

**Stone in the Kidney.** Normal urine contains many chemical salts, such as urea, urates and phosphate, carbonate and oxalate of calcium, etc., which are held in solution. Under certain circumstances these are precipitated in the kidney and are passed as gravel or sand in the urine. These fine particles may be bound together by mucus and form a stone which has a tendency to grow in size by fresh deposits on its surface. If it is smooth and is lodged in one place it produces no symptoms and its presence is not suspected even when it is of a large size. But when it is dislodged and passes through the ureter it produces a severe attack of renal colic (*q.v.*, page 33, Part I). The attack comes on suddenly without any warning or may occur after jolting as in riding or driving on a rough road. It lasts until the stone reaches the bladder or falls back into the pelvis of the kidney; in the former case it may be expelled with the urine or remain in the bladder and grow in size;

in the latter case another attack of colic may occur. If it lodges in the ureter it causes an obstruction to the flow of urine and unless removed produces hydronephrosis (*q.v.*, Part I) and ultimately destroys the kidney.

Preventive treatment consists in taking sufficient fluids so as to keep the urine diluted and prevent the precipitation of the salts and to avoid substances which favour the formation of gravel, such as red meat and highly nitrogenous food. The treatment for the relief of pain is described under renal colic (*q.v.*). If the stone is not expelled and on X-ray examination is found to be too large to pass through the ureter or obstructs the flow of urine, early surgical treatment is necessary for its removal.

**Movable Kidney** (Floating Kidney). The kidneys are situated in the back part of the abdominal cavity one on each side of the spine and lodged in a soft pad of fatty tissue. Normally, it can move a little in the downward direction to the extent of an inch or so. But when the fatty bed is shallow the kidney, particularly the right one, gets displaced from its position and moves more than a couple of inches, for which condition the term movable is used. It is a common condition in women and in a majority of cases produces no symptoms or discomfort. The symptoms, when present, are not referred to the kidney. There may be some sense of weight and dragging in the abdomen and dull aching pain in the loin aggravated on walking or standing which is relieved on lying in bed. Gastric disturbance and neurasthenia are present so that the primary trouble remains unrecognized. In case the pedicle of the kidney gets twisted there is an obstruction to the flow of urine and constriction of the blood vessels and nerves to the kidney causing much pain and discomfort. The symptoms subside suddenly if the kink is removed and the patient passes a large quantity of urine.

No treatment is necessary if the symptoms are mild and do not affect the health. If there is much discomfort an abdominal binder with a soft pad is applied to keep the kidney in its place. This is applied before the patient gets out of bed and removed when she lies down. In case there is much discomfort and the patient's health deteriorates surgical operation becomes necessary to fix the kidney in its place.

The kidneys are subject to suppuration, tubercular disease, cystic degeneration in which its substance is converted into small cysts, and malignant disease. All these are serious conditions and if unilateral the affected kidney can be safely removed by a surgical operation.

**Cystitis.** By cystitis is meant an inflammation of the urinary bladder which may be acute or chronic and which is produced by micro-organisms, usually introduced from outside through the urethra. Any cause that lowers the vitality of the bladder predisposes to infection, such as retention of urine or incomplete evacuation of the bladder on account of urethral stricture, enlargement of the prostate gland, paralysis of spinal origin, and a stone or a foreign body in it, or frequent catheterization.

The severity of the symptoms vary according to the nature and degree of infection and the state of health of the patient. There is frequent and painful micturition with straining and scanty urine which may contain some blood. Pain is felt in the perineum and the lower part of the abdomen. In chronic cases the urine is alkaline, turbid, offensive and shows greyish deposit of pus and phosphates on standing. The septic condition is likely to spread upwards to the kidneys and cause death.

The patient is confined to bed and the cause removed as much as possible. He is kept on milk diet and given plenty of liquids so as to keep the urine well diluted. The pain and straining are relieved by hot fomentations to the abdomen and hot hip-baths. The bowels are kept open by saline purgatives and the urine rendered alkaline in acute cases by alkaline diuretics (No. 75). Belladonna is useful in relieving the spasm of the bladder (No. 51). Sulpha drugs and penicillin are used in cases where the micro-organisms are found to be susceptible to these drugs. In old cases when the urine is very foul it is necessary to wash out the bladder daily with some mild antiseptic lotion. A solution of permanganate of potassium, 2 to 3 grains to a pint of warm water, or  $\frac{1}{4}$  to  $\frac{1}{2}$  per cent of nitrate of silver in distilled water, or a 2 to 5 per cent solution of one of the organic salts of silver, may be used for the purpose. The bladder is first washed out with warm boric lotion or sterilized saline solution through a sterilized rubber catheter after which 2 to 4 ounces of the antiseptic lotion is slowly introduced and allowed to remain in the bladder for a couple of minutes and then allowed to run out. The bladder is again washed with the saline or boric lotion. This is done once a day or twice in bad cases. Certain drugs, that have an antiseptic effect on the urine when taken internally, are also prescribed.

## CHAPTER XI

### DISEASES OF THE LOCOMOTOR SYSTEM

The locomotor system consists of muscles and their fibrous sheaths, bones, and joints. All these are subject to injury, inflammation, suppuration, tuberculosis, and new growths, both malignant and non-malignant. Some of their more common diseases are described here.

**Fibrositis.** It is an inflammatory condition of the fibrous sheaths of muscles and is caused by exposure to cold, injury, severe muscular exertion, etc. The onset is usually sudden, but may be gradual. The parts commonly affected are the muscles of the back, neck and thighs. Pain is the chief symptom which is localized, of a dull aching character or acute and severe, aggravated on movement and continues for some time. The trouble lasts for a week or so and subsides gradually under treatment, which consists in removing the cause if known, rest to the part, application of hot fomentations or radiant heat and administration of salicylate of sodium (No. 85) or aspirin (No. 135) and saline purgatives.

**Myositis.** Myositis, i.e., the inflammation of muscles, is due to the same causes as fibrositis. There is redness of the skin over the affected muscle with fever and some disturbance of health. Suppuration might take place and an abscess may result. In one variety of myositis the muscle fibres degenerate into fibrous tissue and become hard and ossified. This condition affects the back, arms, thighs and in old cases, other parts of the body also. The treatment is rest to the inflamed muscles, hot fomentations and in case of pain, application of sedatives (No. 37). If pus is formed the abscess is opened as soon as possible. There is no treatment for the ossification of muscles.

**Muscular Dystrophy.** The term means defective nutrition and consequent arrest of development of muscles in children. The disease is met with in different forms and may affect several children of the same family without any definite history of heredity, or it may be inherited through several generations, the male children being affected while the females, though free, transmit it to their male offsprings. The disease manifests itself in childhood and the symptom, which attracts attention, is gradual increasing weakness of the legs, the child finding it difficult to climb steps or falls while walking and has great difficulty in getting up. In another variety of the disease the muscles of the shoulder and upper limbs are first to be attacked; while in a third variety known as *Pseudo-hypertrophic muscular dystrophy*, which is more common in males, the muscles, though paralysed, increase in size giving the child an athletic appearance. The disease is progressive and there is no effective treatment for it. It is not directly fatal but the patients do not live long and die of pneumonia or some other intercurrent disease. Regular feeding, massage and proper nursing are the only things to be done.

**Myasthenia Gravis.** This is a rare chronic disease of the muscles, particularly marked in the muscles of the face, throat, larynx and jaws.

The affected muscles get fatigued quickly, so much so that the patient has to rest several times during a meal and is unable to raise his arm above the head or keep it there any length of time; the speech is low with a nasal twang and there is drooping of the eyelids and the facial expression is dull, sad and sleepy. Swallowing is difficult and liquids are regurgitated through the nose. The disease is progressive and may be fatal within a few weeks, there being no effective treatment for it.

### DISEASES OF BONES

**Periostitis.** Periostitis is the inflammation of the membrane covering the bones which is called periosteum. Acute periostitis is localized and is mostly due to an injury. Chronic cases, in which more than one bone is involved, are the result of syphilis. In acute cases there is aching pain in the affected part which is aggravated on movement or pressure and is worse at night. When an abscess develops there is throbbing pain, redness of the overlying skin and a localized swelling. When the abscess is opened or bursts the affected part of the bone is found to be dead being denuded of its blood supply which is derived from the periosteum. A sinus is formed discharging thin purulent fluid and until the dead bone is removed it does not heal. The treatment consists in giving the part complete rest and applying hot fomentations. If the inflammation does not subside soon an incision is made down to the bone, which, if done in time, will prevent suppuration and damage to the bone. If an abscess is formed and a piece of dead bone is felt, its removal will expedite healing.

**Osteomyelitis.** The term is applied to an acute suppurative inflammation of the bone extending into the medullary canal. It is produced by pyogenic, i.e., pus-forming micro-organisms which may have come from some septic focus in the body or a wound in the skin. It commonly attacks poorly nourished children in depressed health. An injury, severe exertion or exposure to cold may be the immediate cause. The onset is sudden with a rigor and fever, the affected part being very painful. The skin over the affected bone is red and swollen and when an abscess is formed the pus burrows under muscular and fibrous layers and appears at some place far from the site of the mischief. The pain and general symptoms are relieved to some extent when the abscess bursts or is opened. In severe infections septic endocarditis or septicaemia may occur with fatal results.

The affected part of the bone, which may be the whole shaft of a long bone, dies, and if left alone may separate from the healthy part and be discharged in course of time which may be weeks or months. During the process of inflammation layers of bone are deposited under the periosteum which take the place of the dead bone. The process of healing can be expedited and dangers of general infection averted by early surgical treatment. The dead bone requires removal as soon as the abscess is opened. The disease is very serious when it attacks the skull, spine or pelvis. Penicillin or sulpha drugs administered early may prevent damage to the bone.

**Osteomalacia.** The term is applied to softening of the bones. It is a disease of grown up persons resembling rickets in children, in which the bones of the skeleton lose their calcium salts, become soft, bend readily under the weight of the body and produce deformities. It is much more common in women than men and generally makes its appearance during pregnancy or after confinement and disappears after lactation and reappears during subsequent pregnancies. It behaves like a deficiency disease and may be due to a deficiency of some glandular secretion. During pregnancy there is a great demand for calcium salts from the mother's system for the development of the foetus and unless these are assimilated from food they are drawn from the mother's bones.

The onset is gradual with pains in the pelvis, spine and legs and increasing difficulty of walking. The general symptoms are vague and do not attract the attention to the real nature of the complaint until there is a marked deformity of the bones of the spine and pelvis. The deformity of the pelvis is liable to cause serious trouble in subsequent pregnancies. The preventive treatment is to pay proper attention to general hygiene and diet which should contain liberal quantities of milk, fresh fruit and vegetables. Light outdoor exercise, sufficient rest at night and attention to the functions of the stomach and bowels are also important. When the disease has developed it is necessary to remain in bed in a well ventilated room, regulate the diet as above and take calcium salts internally.

**Osteitis Deformans.** It is a rare disease in which deformities of the bones are produced. It is gradual in onset and attacks persons over 50. There are indefinite pains in the limbs which get enlarged and bend under the weight of the body while the muscles waste and leave the deformed bones covered with skin. The skull gets enlarged so that the patient has to wear larger hats. The bones of the face remain unaffected. The disease progresses slowly and lasts for an indefinite period. So far no effective treatment is known for it.

**Fragilitas Ossium.** The term means an abnormal fragility of the bones. It is a rare hereditary disease affecting many members of the same family usually during the intra-uterine life. The subjects are often still-born and show signs of several old and recent fractures at birth. If born alive, the tendency continues and the bones are often broken without any cause. The child does not survive long and dies of some intercurrent disease. If it survives for some time the tendency gradually disappears. There is no treatment for it.

**Acromegaly.** This is another rare disease in which the bones of the hands, feet and face become enlarged. It usually attacks persons in early adult life and is due to an excessive secretion of the pituitary gland which is situated in the cranium. If the disease commences before the long bones have ceased to grow a condition known as gigantism results in which the height of the body is abnormally increased and some of the so-called giants are example of this disease. The onset is gradual and the patient suffers from headache, pains in the limbs, mental dullness, lassitude, excessive thirst and appetite and

dimness of vision or blindness. There is no treatment for the disease. Surgical operation undertaken for the removal of the enlarged pituitary gland in suitable cases has produced favourable results but the mortality is high.

### DISEASES OF JOINTS

A joint is made up of ends of two or more bones covered by smooth cartilage to give them a soft even surface, and held together by strong ligaments. The inner surface is lined with a thin membrane known as synovial membrane whose function is to secrete a thin oily fluid to lubricate the joint. The quantity secreted is just enough for the purpose, but under certain conditions, such as injury, inflammation or certain diseases the fluid is not absorbed and accumulates in the joint, which condition is known as *hydroarthrosis*, i.e., water in the joint. The inflammation, if not severe, is confined to the synovial membrane when it is known as *synovitis*, but when severe and due to virulent micro-organisms, it spreads to ligaments, cartilages and the bony ends in which case it is known as *arthritis*. If the process is severe and suppuration takes place, the synovial membrane and the cartilages are destroyed and the raw bony ends unite together and cause permanent stiffness of the joint which is called *ankylosis*. The union may be fibrous or bony between the ends.

**Synovitis.** The inflammation of the synovial membrane may be due to a sprain, twisting or any other injury of the joint, exposure to wet and cold or some general disease, such as gout, syphilis, gonorrhoea, etc. The joint becomes swollen on account of accumulation of fluid in it, which may be clear, bloody or purulent depending upon the cause. The symptoms are a feeling of discomfort about the joint, pain, the severity of which depends on the severity of the inflammation, fever and general disturbance of health. The fluid, unless purulent, might get absorbed and the joint becomes normal again under treatment, but there is a tendency for the trouble to recur on slightest provocation. Complete rest to the affected part, application of strong tincture of iodine or some other counter-irritant and the treatment for the general condition that is responsible for the trouble are necessary by way of treatment. If the fluid does not get absorbed or increases in quantity and causes much discomfort it can be removed by tapping under strict aseptic conditions so as to prevent any micro-organisms gaining entrance into the joint. If pus is formed a very early surgical operation is necessary to save the joint. The early administration of sulpha drugs or penicillin are useful in cases where the infecting micro-organisms are susceptible to these drugs.

**Chronic Synovitis.** This may be the continuation of an acute attack or develop insidiously. In such cases there is usually a good deal of effusion in the joint and thickening of the synovial membrane. The trouble may originate from an injury or some disease as in acute cases. Rest in bed with the limb elevated when much fluid is present, counter-irritants on the joint and the treatment of the primary condition are indicated by way of treatment.

**Acute Arthritis.** An inflammation involving all the structures of a joint, viz., the synovial membrane, ligaments and the bony ends is called arthritis. In rheumatism more than one joint is involved and the trouble shifts from one joint to another. When it is caused by micro-organisms introduced into the joint it is confined to that joint. The infection may be derived from a septic focus which may be present in the teeth, throat, nose, tonsils, etc. The suppuration may spread beyond the joint into the adjoining muscles. It destroys the cartilages covering the bony ends so that in the process of healing the raw ends become united and make the joint permanently stiff and immobile. In milder forms of infection with prompt treatment complete recovery and restoration of the function of the joint is possible. The affected joint is held rigid in a flexed position, it is swollen, the skin over it is red and hot and pain is a prominent feature which is aggravated on movement or pressure. Fever and general disturbance of health are also present. In very severe cases and when several joints are affected simultaneously death may take place from toxæmia.

The treatment consists in keeping the limb at rest in the most comfortable position, applying hot fomentations and counter-irritants and relieving the symptoms. When suppuration has taken place very early surgical treatment is necessary not only to save the joint but to save life also.

**Chronic Arthritis.** It is met with in a variety of forms and may affect a single joint or several joints simultaneously. It may attack persons in apparent good health and is common after 40. There may be no obvious cause, or it may follow influenza or some other acute infectious disease, or as a complication of gonorrhoea. Very often there is a septic focus in the nose, throat, tonsils, etc. The onset is usually gradual or it may be the continuation of an acute attack. The early symptoms are pain and some stiffness in the joint which is more marked after rest, there may be some effusion in it. There is wasting of muscles of the limb which easily gets fatigued. Frequent neuralgic pains, headache and slight fever may be present. Loss of appetite and digestive disturbances are common on account of compulsory sedentary life.

A variety of chronic arthritis is known under different names, such as *rheumatoid arthritis*, *osteo-arthritis* or *arthritis deformans*. It is a very chronic condition in which the cartilages covering the bones are destroyed, and the bony ends thickened causing marked deformity, stiffness of the joints, pain, wasting of muscles and much disturbance of general health. It is a very chronic disease and may affect a single joint or several of them at the same time. In a large majority of patients a septic focus is present in some part of the body which may not be producing any noticeable symptoms; when a single joint is affected there is a history of an old injury to the joint. In course of time the stiffness increases to such an extent that the patient is crippled and incapacitated from any kind of work.

The treatment of this disease is not very satisfactory. Its progress may be arrested so that the patient is able to move about and attend to his work provided the treatment is undertaken at an early date and

the cause discovered and removed. In many cases even after the removal of the apparent cause the benefit derived is very limited. The limb should not be put in splint or immobilized on any account as it will hasten stiffening but should be used as much as possible without undue fatigue. The application of counter-irritants and hot fomentations are useful in relieving pain. Bee venom injected about the joint seems to have a beneficial effect. Exposure to wet and cold should be avoided and the joint protected with a flannel bandage. Internally iodide of potassium (No. 82) or one of the organic preparations of iodine in increasing doses may arrest the progress. A course of treatment at one of the watering places is beneficial in the early stages.

**Loose Bodies in the Joint.** Under certain conditions loose bodies of various sizes are found in joints which are derived from consolidated blood clots or broken pieces of the cartilage of the joint. It is more common in the knee than any other joint. It does not produce any symptoms except when one of the bodies is caught between the articular surfaces, when sudden and severe pain is caused and the joint is momentarily locked. If allowed to remain for long in the joint they produce chronic inflammation of the synovial membrane. The treatment is a surgical operation for their removal.

## CHAPTER XII

### SURGICAL DISEASES

Many diseases affecting different parts of the body requiring surgical treatment are described under different heads, while a few important ones are given here.

**Abscess.** An abscess is an accumulation of pus in some part of the body caused by an invasion by micro-organisms. These may gain an entrance from outside or come from some focus in the body. Their presence calls into play the defensive mechanism of the body which prevents them from spreading and destroys them, the white blood corpuscles taking an important part in this. Some destruction of the tissue takes place and the dead corpuscles that have ingested the bacteria with the dead tissue form the pus. An abscess may be acute or chronic. In the acute abscess there is much pain of a throbbing variety with general disturbance; it feels hot and when the pus is formed it fluctuates when pressed with fingers. If situated near the surface and not opened in time it bursts through the skin or the mucous membrane, discharges the pus and if kept clean heals readily. If it is in one of the organs, such as lungs, liver, appendix, brain, etc., it is not likely to open on the surface but requires surgical help to evacuate the pus. If allowed to remain untreated it bursts into one of the body cavities and may produce dangerous complications. In the early stage before suppuration has taken place, hot fomentations, application of belladonna plaster (No. 128), and rest to the part might reduce the inflammation, but once an abscess is formed the sooner it is opened the better. The throbbing pain and other unpleasant symptoms subside rapidly as soon as the pus is allowed to escape.

A chronic abscess is one in which there is no active inflammation and pain is slight or absent. It is mostly due to tuberculosis of bones or other tissues or to pyogenic organisms of low vitality and is often found far from the site of the disease. When due to pyogenic organisms, opening the abscess and scraping the walls bring about a cure, but when due to tuberculosis the disease requires treatment.

**Appendicitis.** The appendix is situated in the right flank and is a relic of the foetal life and has no particular function to perform and its removal does not affect the health. It is liable to be inflamed and produce local and general symptoms which vary in severity. The inflammation may be mild and subside with rest and treatment or it may be very severe and cause gangrene within a few hours, or peritonitis and death within a day or two. Both, the mild and the severe varieties, commence with the same initial symptoms and it is not always possible to predict what course it is going to take. In young children it is mostly of a severe type.

The onset is somewhat sudden and the patient, apparently in good health, experiences a feeling of malaise and pain in the abdomen which is felt about the navel in the beginning, but soon becomes localized in the right flank which is tender on pressure. The pain varies in

severity and duration in different persons. The general symptoms are fever, loss of appetite, constipation and in children very often diarrhoea. With rest and fomentation a mild attack subsides in 3 or 4 days and in a few cases it may not recur again for life, but in a large majority of cases it is liable to return after an interval of weeks or months and a first mild attack may be followed by a severe and a fatal one. In more severe cases the general and local symptoms are aggravated, the fever rises to 104 and the pain is severe and a swelling develops in the right flank, and the muscles of the abdominal wall on that side become hard and stiff as compared with those on the other side. By gently feeling with the flat of the hand the stiffness and the swelling can be elicited except in very obese patients. While doing this very little pressure should be used lest the abscess is ruptured into the peritoneal cavity with a fatal result. The same thing is likely to happen if the abscess is not opened in time and bursts spontaneously. In very rare cases the abscess may open on the abdominal surface or into the bowel and a spontaneous cure may result, but such cases are very rare.

In a fulminating variety the suppuration develops very rapidly and the pus instead of being localized is spread in the peritoneal cavity and produces fatal peritonitis. In other cases the appendix becomes gangrenous within 48 hours and kills the patient unless very early surgical help is given.

**TREATMENT.** On the least suspicion of appendicitis the patient is put to bed and not allowed to get up on any account, as any kind of movement is dangerous and might convert a mild attack into a fatal one. Purgatives should be avoided, as the movement of the intestines and the straining of the abdominal muscles are likely to bring about the same result. The pain of appendicitis is liable to be mistaken for ordinary colic and as constipation is also present there is a tendency to purge the patient and massage the abdomen. This is common among certain classes in India who requisition the services of a "specialist" in abdominal massage, who vigorously massages the abdomen so as to replace an imaginary gland whose displacement, according to him, is responsible for the symptoms. Such treatment is dangerous and has cost many a patient his life.

It is not always possible to predict which case is likely to be benefitted by expectant treatment and which requires immediate operation. In every case, if competent surgical help is available, it is advisable to have the appendix removed within 24 hours of the onset, as in such cases the operation is free from serious risks. The expectant treatment may be justified if the temperature is not above 101, pulse not more than 110 per minute and the pain not very severe or constant. It consists in absolute rest in bed, hot fomentations locally, light liquid diet and an enema, if necessary, to clear the bowels. If within 48 hours the symptoms do not show any signs of improvement or are aggravated, an urgent operation becomes necessary.

After a mild attack has subsided it is advisable to have the appendix removed during the quiescent period; the operation is then unattended with risks. An appendix, which has once been inflamed, is liable to

be attacked again and the subsequent attack may not be so mild and may come on at any time and the patient may not be in a position to get immediate surgical help.

**Bubo.** A bubo is an inflamed lymphatic gland which may suppurate and form an abscess, the most common sites being the groin and the armpit. One of the functions of the gland is to arrest and dispose off any foreign matter that has entered the body, but if the infection is virulent suppuration takes place. Any kind of septic wound in the area of the skin from where the lymph is carried to the gland is likely to cause the trouble. In the groin it is often due to a venereal sore. The treatment is to clean the wound and apply fomentations and bella-donna plaster to the bubo and give the part rest. If it suppurates it is treated as an abscess. The bubo found in bubonic plague usually subsides after the patient recovers, but may suppurate and require opening.

**Bubonocoele.** See Hernia.

**Bunion.** A bunion is a painful swelling on the side of the base of the great toe and consists of a closed sac or bursa which is formed by the constant pressure of ill-fitting shoes. Normally, such bursae are present in some parts of the body subject to pressure, such as the knees and elbows. When these are inflamed from injury the condition is known as bursitis. Bunion is a common complaint in civilized communities, particularly in women who habitually use narrow shoes which press the great toe outward with the result that the head of the first long bone of the foot (metatarsal bone of the great toe) is exposed to constant pressure where the bunion forms. The treatment is to adopt a more rational and comfortable foot-wear. Surgical help may be required if there is much deformity or pain or when the bursa suppurates.

**Cancer.** See Tumours.

**Carbuncle.** See page 17, Diseases of the Skin.

**Deformities.** Deformities in different parts of the body arises from various causes and may be congenital when they are due to defective development of some part during intra-uterine life, or they may be acquired after birth as a result of disease or injury. Most of the former tend to become worse as the child grows but if taken in hand early most of them can be removed completely or mitigated considerably. A special branch of surgery, called orthopœdic surgery, deals with them. Some of those more commonly met with are described here.

**Harelip and Cleft Palate.** Harelip is a condition in which there is a congenital cleft in the upper lip due to defective development. It may be a simple one extending upward or may be a Y-shaped fissure, the bifurcations pointing towards the nostrils. When a similar cleft exists in the palate the condition is called cleft palate which may affect the soft palate or extend forward into the bony part also. The harelip and cleft palate may exist alone or both may be present in the same subject. When both are present they interfere with the nutrition of the child who is unable to suck. In such a case an early operation is necessary as a life-saving measure, otherwise the operation is performed,

if the child is in good health, between the 3rd and the 6th month; if delayed too long it becomes more difficult and some permanent defect of speech is likely to persist.

*Wry-neck.* This deformity may be acute and of a short duration or chronic and permanent and is due to unilateral contraction of the muscles of the neck. The acute variety is sudden in onset and due to muscular rheumatism from exposure to cold air when the body is warm and moist. The head is drawn down towards the shoulder on the affected side and the movements of the head and neck are limited and painful. The treatment consists in applying hot fomentations, mustard plaster and gentle massage of the muscles, administration of a saline purgative and aspirin powder (No. 135) thrice daily. The trouble subsides after 4 or 5 days.

The chronic variety may be congenital due to damage to the muscles of the neck or their defective development during the intra-uterine life, or it might be acquired later as a result of injury or disease. The congenital deformity is not noticeable until the child is 3 or 4 years old. If left alone it tends to get worse, but if taken in hand early it can be reduced or removed completely. The acquired variety is not easily amenable to treatment and may require an operation. A spasmodic and a hysteric variety of wry-neck are also met with. The former is common in young persons of neurotic disposition and may be brought on by defective vision which makes the patient tilt his head to one side while reading. The head is constantly jerked and twisted into the abnormal position. The treatment consists in the improvement of general health, local application of electricity and correcting the vision with glasses. For hysterical wry-neck no special treatment is required apart from that for the primary condition.

*Deformities of the Spine.* These are either congenital or acquired. The most common congenital deformity is known as *spina bifida*. In this, on account of a defect in development of the spine there is an opening in the back part of the bony canal through which the contents of the spinal canal protrude under the skin which is stretched over the swelling. The size of the opening depends on the number of vertebrae affected. If it is small and the spinal cord not included in the protrusion it is possible to obliterate it by an operation, but if large and the cord included in it the chances of survival of the child are very slender and few live more than 4 or 5 years.

*Acquired Deformities of the Spine.* These mostly consist in the deviation of the normal curvature of the spine. The spine as seen from the front has no lateral curve, but seen from the side it presents four curves, the cervical and the lumbar with the convexity forward and the dorsal and the sacral with the concavity directed in front (see Fig. 2, Part I). Under certain abnormal conditions the normal curves are either reduced or exaggerated, or an abnormal lateral curve is developed. The angular curvature of the spine, popularly known as hunchback, is due to the destruction of one or more vertebrae as a result of tuberculosis. The abnormal lateral curvature of the spine, known as *scoliosis*, is common in rickety children or young growing persons with weak muscles due to

physical overwork, inadequate nourishment and unhygienic living conditions. It is also produced by any asymmetrical condition of the body, such as shortening of one leg or tilting of the pelvis to one side or in students by astigmatism. The treatment is directed towards removing the cause and improving the general health.

*Deformities of the Fingers and Toes.* Many congenital and acquired deformities of the fingers and toes are of no significance as long as they do not interfere with the usefulness of the limb. One or more fingers or toes may be absent from birth, most commonly the thumb or the great toe, or one or more supernumerary digits may be present, which are, as a rule, stunted and imperfectly developed and could be removed with ease. Webbed fingers or toes is another common congenital deformity. They could be separated without any difficulty. The acquired variety of webbed fingers is due to burns or other injury in which case the loss of skin and other tissues is great and may require skin grafting after removal of the thick scar.

*Deformity of the Hip.* The most commonly met with deformity of the hip is the congenital dislocation of one or both the heads of the femur. It does not attract the attention of the parents until the child begins to walk, or some abnormality is suspected from the peculiar position in which the legs are kept when the child lies on its back. The gait of the child, when it begins to walk, is peculiar and waddling, the buttocks are prominent, the back is hollowed and the abdomen protruding. The condition gets worse if left untreated. If taken in hand soon after birth the dislocation can be reduced and the bone kept in place by a plaster jacket, but if neglected until the child grows up an operation would be required to correct the deformity and even then the result may not be satisfactory.

*Deformities of the Knee Joint.* These may be congenital or acquired, the latter are more common and are seen in the form of knock-knee and bow-knee. One or, more commonly, both the knees are affected. The deformity is the result of softening and irregular growth of the end of the bones forming the knee joint due to rickets. Bow-knee is usually accompanied with bow-legs. These are found in poor badly nourished children living under unhygienic conditions. If taken in hand early and the child prevented from walking the deformity can be prevented or reduced but when it is well established surgical treatment becomes necessary.

*Back-knee.* In this deformity the knee joint is over extended forming an angle pointing backward. It is congenital and is due to weakness of the ligaments of the joint. Very early treatment is necessary before the child attempts to walk. In old cases a special apparatus to prevent over-extension of the knee is used which allows the patient to go about in comfort.

*Deformities of the Foot.* The foot is subject to many kinds of congenital and acquired deformities which are all popularly known as club-foot. The foot may be everted so that the child walks on the inner border of the foot, or it may be inverted when it walks on the outer border. Similarly it may be extended so that the toes alone touch

the ground or flexed allowing the heel to be in contact with the ground. Normally, the foot is kept in position by the action of opposite sets of muscles, of which there are four, one in front, one behind and one on each side. When one of the sets is paralysed the constant pull exerted by the opposite set draws up that side of the foot. If the outer set is paralysed the muscles on the inner side invert the foot, similarly the outer muscles keep the foot everted when the inner ones are affected. The same thing happens when either the front or the back muscles are paralysed, the foot being drawn up to their side by the healthy muscles. The loss of muscular power may be congenital or acquired as a result of infantile paralysis (*q.v.*) in which a single muscle or a set of muscles is affected. The deformity tends to get worse as the paralysed muscles are permanently stretched and the bones lose their normal shape and the ligaments become contracted. In the early stages the foot can be easily restored to its normal position by manipulation, and if the paralysed muscles are not allowed to be stretched they regain their power in time with massage and electric treatment. Special boots and apparatus are made to keep the foot in its normal position. If neglected surgical treatment becomes necessary.

*Flatfoot or Splayfoot.* This is mostly an acquired deformity in which the normal arch of the foot, which acts as a shock absorber, is flattened so that the whole surface of the sole touches the ground. It is met with in growing children and adolescents with weak muscles who have to stand for long periods or walk long distances with heavy loads. Under such circumstances the arch of the foot which is sustained by muscles and ligaments gives way. The patient is unable to stand or walk for long without pain and discomfort. In the early stages the arch can be restored by manipulation and if proper treatment is given, it remains in place, but if neglected the muscles and ligaments get stretched and fix it in the abnormal position requiring a surgical operation to correct the deformity. The child should be put to bed as soon as the defect is detected and not allowed to put any weight on the foot. Locally, massage and electric treatment to restore the tone of the muscles and internally tonics, nourishing food and measures for the promotion of health are indicated. When the pain subsides and the patient can go about, a soft pad or an arched spring to support the instep should be provided and the child prevented from walking or standing for long until the foot is quite strong.

*Displacement of the Great Toe.* This displacement of the great toe outward (*hallux valgus*) is an acquired deformity met with in women who wear narrow shoes which bend the toe outward and in course of time fix it in this abnormal position where it lies either above or below the next toe. The head of the first long bone of the foot (*metatarsal*) is exposed and becomes prominent and in time is covered with a *bunion* (*q.v.*) which becomes inflamed and painful. Chronic arthritis is set up in the joint which is a constant source of trouble. In the beginning the deformity can be remedied by wearing properly shaped shoes with broad toes and the inner border straight from the heel to the tip and using a soft pad between the toes. In chronic cases where the toe is

permanently fixed in the abnormal position with arthritis of the joint relief can be obtained by a surgical operation.

*Squint or Cross-eye.* The eyeball is moved in different directions by muscles attached to its outer surface, and normally there is a complete co-ordination between the muscles of both the eyeballs so that while looking at an object the visual axes of both the eyes meet at a fixed point, but when a muscle on one side is weakened or paralysed it is unable to move the eyeball to that side, while the opposite healthy muscle keeps it to the other side producing the condition known as squint. The deviation may be in any direction and depends on the muscle affected. As the visual axes do not meet at a fixed point the patient has either a hazy or a double vision, the healthy eye having a brighter vision than the squint one. The deformity may be congenital or acquired and is a serious handicap to the child and interferes with his study. In course of time the vision in the affected eye is completely lost. In the very early stage with suitable exercise the tone of the muscles could be restored but in old cases operative treatment is necessary which should be undertaken before the squint eye becomes blind.

*Deformity of the Tongue.* In very rare cases the tongue is partly or entirely absent. Sometimes there is a cleft in it of varying length which may extend the whole length of the organ. The commonest abnormality is what is known as tongue-tie in which the tongue is tied down to the floor of the mouth by a fold of mucous membrane which prevents it from protruding. These deformities require surgical treatment.

*Extroversion of the Bladder.* This is a rare congenital deformity in which the development of the lower part of the abdominal wall and of the front wall of the urinary bladder is defective so that the mucous membrane of the back wall is exposed just above the pubis where the two orifices of the ureters conveying urine from the kidneys can be seen discharging drops of urine. In the male the penis is small and rudimentary. On account of the constant dribbling of urine the clothes are offensive and the skin inflamed. Plastic operations are devised to form a new front wall of the bladder, but the result is not satisfactory. The patient can go about with a well fitting urinal which is emptied at intervals, or an operation performed to transplant the ureters into the large intestine so that the urine is passed per rectum.

*Deformities of the Male Urethra.* Two kinds of congenital deformity are met with in male urethra, in one of which, known as *hypospadias*, the floor of the urethra is absent for a varying distance, and the other, known as *epispadias*, in which the roof is deficient so that when the urine is voided it escapes from the upper surface of the penis. In some rare cases the scrotum is cleft and the urethra opens in the perineum. In such cases the penis is small and undeveloped resembling a clitoris and the testes are undescended, the cleft between the split rudimentary scrotum resembles the vulva. Under such circumstances the sex of the child is mistaken and he is brought up as a girl until the mistake is detected at puberty. In case the deformity is limited in extent and is not likely to interfere with the successful performance of sexual inter-

course no treatment is necessary, but when it is extensive a plastic operation may be undertaken to restore the urethra.

*Deformity of the Testicles.* In the foetus the development of the testicles takes place in the abdomen and they begin to descend during the 8th month of the intra-uterine life and reach the bottom of the scrotum by the middle of the 9th month. On account of some abnormality one, or less commonly both, remain in the abdomen or at some point on their way to the scrotum, which remains empty and undeveloped. The undescended testis can be felt as a soft globular swelling in the groin where its progress is arrested or may not be felt if it is in the abdomen. It does not develop but, if allowed to remain in its abnormal place, atrophies and becomes functionless. An undescended testis is very liable to be affected with malignant disease. When not very high up gentle manipulation by way of traction and pressure might succeed in bringing it down. The administration of gonadic hormones has been found in many cases to cause the testis to descend without any trouble. Failing that early surgical operation is advisable.

*Deformity of the Anus.* The most common deformity met with is the congenital imperforate anus in the new-born. The rectum ends in a blind end either near the anal opening through which it bulges, or anywhere from the brim of the pelvis to the anal opening. In rare cases it opens into the bladder and the faeces escape through the urethra. A very early surgical operation is the only means of saving the child's life. When the end of the rectum is very high up the result of the operation is not satisfactory.

**Fissure of the Anus.** This term is applied to a painful sore at the lower and back part of the anal canal. It is caused by the friction and irritation due to the passage of hard faecal matter in chronic constipation. At the end of the fissure near the anal margin there is a small round tag of skin which is known as the "sentinal pile" although it is not a true pile. In the early stages burning pain is felt at the time of defaecation, but later it becomes more severe and lasts for hours and is felt in the back and down the thighs and legs. In early cases the removal of constipation by mild laxatives and the use of a lubricant such as vaselin or boric ointment before defaecation may be enough to effect a cure, but when it becomes chronic surgical help is necessary.

**Fistula-in-ano.** By this term is meant a narrow suppurating tract in the vicinity of the anus and the lower part of the rectum as a result of an abscess. The fistula might open outside on the skin only or in the rectum or in both the directions. The tract might be short and straight or it may be long and tortuous with branches winding round the rectum. If left untreated the condition tends to get worse and extends in several directions. It is very liable to be infected by septic matter from the bowel making the treatment more difficult. The only successful method of treatment consists in opening up the suppurating tracts, scraping the walls and allowing them to heal from the bottom. When there are many winding branches it is difficult to deal with them all at one sitting and the trouble is likely to recur if any branches are overlooked requiring further operation.

**Gall Stones.** Gall stones are formed in the gallbladder or the bile ducts and mainly consist of the normal constituents of the bile which are precipitated when the organ is affected with chronic inflammation. They are common in stout women past middle life. In the beginning the symptoms are referred to the stomach. They are, a sense of weight and distension, flatulence and constipation. They might be preceded by an attack of biliary colic and slight jaundice. Frequent chills, fever and constitutional symptoms are present on account of the septic infection of the bladder. If the trouble is not old and the stones not large medical treatment may be sufficient to effect a cure. It consists in regulating the diet so as to avoid overloading the stomach with rich food, taking regular open-air exercise, drinking plenty of water and the use of mild salines to regulate the bowels. The administration of salicylate and bicarbonate of sodium (No. 85) is beneficial. If the trouble persists in spite of the above treatment a surgical operation for the removal of the stones and the relief of septic inflammation is very advisable as such gallbladders are very liable to become cancerous.

**Ganglion.** Ganglion is a small swelling containing a clear jelly-like fluid which occurs in the vicinity of joints or tendon sheaths, the most common sites being the back of the hand or foot and the vicinity of the knee. It is small and painless and does not interfere with the usefulness of the limb, but may increase in size and become painful in which case it has to be removed.

**Gangrene.** Gangrene or mortification of tissues may affect a whole limb, a part of it or any organ in the body. When it is limited to a small superficial area it is known as sloughing and the dead tissue as a slough. The causes which produce gangrene are many which bring about a stoppage of circulation in the part. This may be due to a ligature applied on the outside, to the gradual thickening of the small arteries and the obliteration of their lumen as is likely to happen in patients suffering from chronic gout or kidney disease, to the persistent arterial spasm as happens in a disease known as Raynaud's disease or in chronic ergot poisoning and the invasion of certain very virulent bacteria which produce a fatal variety of rapidly spreading gangrene known as *gas gangrene*. The signs of gangrene are, the loss of temperature, all sensation and function of the part, and the change of colour, the part becoming dark or dark green. Although the sensation is absent there is a good deal of pain present.

Gangrene may be dry or moist according to the condition of the part at the time of mortification. In the former variety the circulation is very gradually cut off and the tissues become denuded of their fluids so that the part becomes dry and shrivelled up, and in the latter as a result of sudden cutting off of the blood supply the tissues retain their fluids and are invaded by bacteria which cause putrefaction. If the patient's power of resistance is weak the process spreads to the healthy tissues, and death from septic poisoning results. Under favourable conditions the process is arrested and in course of time the dead part is separated from the adjoining healthy tissues.

**TREATMENT.** In the pre-gangrenous stage when the signs of defective

blood supply become evident, such as coldness, numbness, heaviness, a sense of fatigue and pain, much can be done to improve the circulation and increase the vitality of the part by light massage, gentle friction in the direction of the venous flow and measures for the improvement of health. When the gangrene has actually set in, the best treatment is the removal of the dead part as soon as the line of demarcation has been formed between the dead and healthy tissues, or in case of spreading gangrene as far from the affected part as possible, as otherwise the gangrene is sure to attack the stump. Gas gangrene is caused by a particularly virulent form of bacteria and it spreads very rapidly and causes death in a short time. Fortunately, these bacteria are very susceptible to the action of penicillin which, if administered in time, will save life and limb. In every case where the wound is contaminated with garden soil or road dust penicillin should be administered as a prophylactic as well as anti-tetanic serum.

**Goitre.** The term is used for an enlargement of the thyroid gland which is situated in the neck in front. It is divided into simple or non-toxic and toxic; the latter is also known as Grave's or Basedow's disease. It is sometimes called exophthalmic goitre on account of the prominence of the eyeballs present in many patients suffering from it. The simple goitre is endemic in certain localities being common in some parts of Switzerland, Northern Italy, England, North America and India. It is attributed to some infection in drinking water and also to a deficiency of iodine in food and water. It does not usually produce any severe symptoms and apart from the disfigurement and its large size it does not cause any inconvenience to the patient. When large it might press on the windpipe and produce difficulty of breathing and swallowing. In the endemic areas the administration of iodine in the form of iodide of sodium mixed in drinking water or food is given as a prophylactic and all drinking water boiled before use. A large and troublesome one can be removed by an operation.

The toxic goitre may not be very large but the symptoms are severe due to an excessive secretion and absorption of it into the system. The disease is mostly met with in adult women who have been subject to overwork and anxiety. The onset is more or less sudden after some mental strain or nervous shock. The symptoms are palpitation, fast pulse, anaemia, loss of weight, tremors in the limbs, nervousness and weakness of the heart muscle. These react on the general health and shorten life.

The treatment consists in giving the patient complete rest in bed and freedom from all mental strain, and adopting measures for the promotion of health. Bromides and other sedatives are administered to quieten the heart and soothe the nerves. In the early stage an exposure to the X-rays is beneficial. Unfortunately all patients do not react favourably to such palliative treatment and surgical operation becomes necessary which has to be undertaken before any damage is done to the heart and blood vessels. In mild cases the main arteries of supply to the gland are ligatured so as to limit its blood supply and reduce its secretion. In more severe cases a part or the whole of the gland is

removed, in the latter case the administration of thyroid extract by the mouth is necessary to make up for the loss of secretion of the gland.

**Haematoma.** A haematoma is a swelling containing blood as a result of an injury. Usually in an injury the blood is diffused through the injured tissues and their surroundings, but in some localities it collects in a cavity. It feels like an abscess but the signs of inflammation found in an abscess are absent. If not very large it subsides in time without any treatment. Frequent gentle massage and rest to the part will hasten the absorption of the blood. A large one requires tapping to remove the blood. It may suppurate in which case it is treated as an abscess.

**Hernia or Rupture.** Hernia means the protrusion of an organ or a part of it through an opening in the walls of the cavity in which it is normally situated. The brain, lungs, stomach, bowels or any other organ may be affected. In this place the protrusion of the bowel from the abdominal cavity is dealt with, which condition is popularly known as rupture. It is called after the locality in which it takes place, viz., umbilical, inguinal, femoral, etc. The umbilical hernia is mostly congenital and is found in the new-born. There is a swelling at the navel containing a small loop of the bowel which comes out through a gap between the muscles at the point where the umbilical cord emerges from the abdomen. When small it is liable to be included in the ligature applied to the cord and the bowel cut with it producing serious consequences. If from the beginning the protrusion is kept in the abdomen by a wide strip of adhesive plaster applied in such a way as to fold the umbilical scar inwards and fix it in that position, the opening closes by itself in time. If large a surgical operation is necessary for its radical cure.

The inguinal hernia is more common in the male and the femoral variety in the female on account of the anatomical peculiarities of the parts in the two sexes. In the former the bowel leaves the abdominal cavity and travels through the passage in the groin known as the inguinal canal, through which the testis descends into the scrotum during the intra-uterine life, or it may come out through a tear in the lower part of the abdominal wall. The size of the scrotum depends on the amount of the contents and may reach to an enormous size if neglected. In some cases the bowel does not descend as far as the scrotum but forms a small bulging in the groin when it is known as a *bubonocoele*. The tendency for a rupture is to grow bigger, as any increase of pressure in the abdomen, as while coughing, straining, etc., forces more gut through the opening. An inguinal hernia resembles in appearance a hydrocele, but in the latter the spermatic cord can be clearly felt above the scrotal swelling which does not extend upward beyond the scrotum, while in hernia the bowel can be felt going up to the abdomen and the spermatic cord is not so distinctly felt. If the upper part of the scrotum above the swelling is held between the thumb and the fingers and the patient asked to cough a clear downward impulse is felt as the bowel is pushed down.

In the femoral hernia the bowel protrudes through the opening in

the groin through which the large blood vessels for the lower extremity come out. A small soft round swelling is formed just below the groin, which, when tapped with fingers gives a hollow resonant note. The contents can be pushed back when the patient is lying down but return as soon as she stands.

Apart from the inconvenience, discomfort and pain serious complications are likely to arise from a hernia. It may become irreducible so that it cannot be pushed back into the abdomen, the bowel in it may become obstructed on account of an accumulation of hard faecal matter or the loop of gut in it may be strangulated by some constriction which cuts off its blood supply and makes it gangrenous with fatal results unless relieved in time by an operation.

The treatment is either palliative or radical, the former consists in wearing a truss which is an appliance containing a steel spring and a pad to exert pressure on the opening to keep the bowel from descending. It should fit comfortably, exert sufficient pressure to prevent the bowel to come down and have a sufficiently large pad to cover the opening. It is advisable not to buy a ready-made one but order it from some reliable surgical instruments makers. If ordered by post the measurement round the body at the level where it is to be worn and the size of the pad should be given. The palliative treatment is suitable in case of a small hernia in persons whose occupation is not of a strenuous nature and who are not subjected to sudden heavy strains. Even in such cases, considering the risk of sudden strangulation to which all hernias are liable, the radical treatment is advisable; moreover, the chances of a successful result are greater in early cases with a small rupture. For persons whose occupation calls for hard physical work and who are exposed to injury the radical treatment is very desirable and the sooner it is undertaken the better. In case of strangulation or obstruction, unless it can be reduced by manipulation, an early operation is the only means of saving the life of the patient. After the operation the patient should refrain from hard physical work and sudden efforts for about six months so as to allow the scar to consolidate. In the absence of surgical help an attempt might be made to reduce a strangulated hernia by very gentle manipulation which is carried out when the patient is lying in bed. His thighs are flexed on the abdomen and supported in that position by pillows and the patient asked to relax the abdominal and thigh muscles. The hernia is supported from below by the left hand and with the right hand very steady pressure is exerted on the swelling in such a way as to squeeze the contents back into the abdomen through the opening. Great care and gentleness are necessary, lest the strangulated bowel, whose vitality is low, is ruptured. If unsuccessful cold compresses might be applied to the part and another attempt made after a few minutes; if still unsuccessful no time should be lost but the patient taken to the nearest hospital.

**Hydrocele.** The term is applied to a collection of serum in the tunica vaginalis which is the serous sac covering the testis. Normally the little fluid that is secreted in it gets readily absorbed, but under certain circumstances either more fluid is secreted than is absorbed or the process

of absorption is deficient with the result that the fluid collects in the sac. It forms a round swelling varying in size and tenseness; it may be so tense as to feel like a solid tumour. It does not extend into the abdomen and the spermatic cord can be felt above the swelling which does not give an impulse on coughing as is felt in hernia. It may be small and remain so for years without giving trouble or become so large as to cause pain and inconvenience from its weight and drag down the skin of the abdomen burying the penis in it.

The treatment is either palliative or radical, the former consists in tapping it with a special trocar and cannula and supporting the scrotum with a suspensory bandage. The sac fills up again after a time and the tapping has to be repeated. After tapping the sac is sometimes injected with some irritating fluid to cause inflammation and its obliteration, but it is rarely successful. The radical treatment consists in removing the sac by an operation.

**Haematocoele** means an accumulation of blood in the tunica vaginalis on account of an injury to the scrotum or sometimes after tapping a hydrocele when a blood vessel is accidentally injured. If it is a small one it requires no special treatment except rest and application of cold lotion, but if it is large most of the blood can be removed by tapping.

**Varicocele.** When the veins of the spermatic cord in the scrotum are dilated and varicose the condition is known as varicocele. It is due to congenital weakness of the walls of the veins or absence of valves in them. It is mostly found in young persons and is more common on the left side. In old patients it is always due to a malignant disease in the pelvis or abdomen which presses on the veins coming from the testis. When felt with the fingers the scrotum feels like a bag containing worms. The swelling is reduced or disappears when the patient lies in bed. In mild cases bathing the part with cold water several times a day and supporting the scrotum with a well fitting suspender are all that is necessary, but if it is painful and the patient worries about it the radical treatment for the removal of the enlarged veins might be undertaken.

**Hydronephrosis.** By hydronephrosis is meant a condition in which the renal pelvis, i.e., the saccular cavity in connection with the kidney through which the urine passes into the ureter, is distended on account of a gradual obstruction to the passage of urine. The obstruction may be in any part of the urinary tract. When it is in one of the ureters the condition is unilateral but when it is in the bladder or the urethra it is bilateral. The obstruction has to be incomplete and act for a prolonged period to produce the distension, because if it is sudden and complete the kidney stops secreting and there is no distension. It may be congenital or acquired, in the former case it is due to some defective development of the urinary apparatus, and in the latter it may be caused by stone formed in the kidney and arrested in the ureter on its way to the bladder, or by a growth in the urinary passage, or by the pressure of an extrinsic tumour. The distended kidney may be very large and could be felt on one side of the abdomen. If for some reason the obstruction is temporarily removed the patient passes a large quantity of urine and the swelling disappears. Suppuration might take place in

the sac when its contents are a mixture of pus and urine and the condition is known as *pyonephrosis*. There is no medical or palliative treatment for either of the conditions. If the trouble is unilateral and the opposite kidney is functioning properly the distended kidney can be removed when the healthy one becomes enlarged and carries on the function of both.

**Ingrowing Toe-nail.** This condition, which affects the great toe, is met with in young persons who habitually use narrow badly-fitting shoes which press the skin against the edge of the nail and cause ulceration and pain which prevents the patient from walking. In the early stages with rest and fomentation to the part, trimming the nail evenly and the use of properly-fitting shoes, a cure can be effected. A small clean plug of cotton-wool between the edge of the nail and the ulcer will prevent pain from friction. In old and more severe cases the projecting part of the nail with the underlying nail-bed will have to be removed.

**Intestinal Obstruction.** It is a condition in which the onward passage of the intestinal contents is obstructed. It may be acute when it occurs suddenly with severe symptoms and ends in death unless relieved in time by surgical measures, or it may be chronic which sets in gradually but ultimately ends in acute obstruction. The acute obstruction may be due to (1) paralysis of the bowel wall as a result of septic inflammation of the peritoneum or of an obstruction to the circulation of the bowel, (2) the presence of a large hard mass or a growth in the bowel, most commonly a cancerous one, and (3) a constriction or strangulation of the bowel as may happen in hernia.

The onset of the acute variety is quite sudden and is ushered in with colicky pain which may be so severe as to double up the patient. This is soon followed by shock as seen from the pallor of the face, cold extremities, clammy sweat, small rapid pulse and intense prostration. The abdomen becomes distended with gases and vomiting becomes a distressing symptom, it is persistent, the patient at first brings up the contents of the stomach, then the bile and finally faecal fluid. The persistent loss of fluid from the system and the absorption of the decomposed matter in the bowel bring about a state of collapse. The vomiting is not severe when the obstruction is in the large intestine. Constipation is present from the beginning, but the contents of the bowel below the obstruction may be evacuated, thereafter there is no evacuation. The condition, unless relieved in time, rapidly gets worse and ends in death.

In chronic cases there is gradually increasing narrowness of the canal. It occurs in old persons and is due to a malignant growth in the bowel which slowly fills up the lumen. The symptoms are indefinite in the early stages, but there is gradually increasing constipation which requires frequent use of purgatives. The patient loses weight, becomes weak and is unable to take proper nourishment. The obstruction may become acute at any time during the course of the disease.

The treatment of intestinal obstruction consists in surgical interference as soon as possible and before toxæmia and collapse set in. The earlier it is undertaken the better the chances of recovery for the

patient. Expectant or palliative treatment is certain to end in death.

**Quinsy.** It is an acute suppurative inflammation of the tonsil as a result of infection by pus-forming bacteria. It comes on fairly suddenly with a rigor and fever. The tonsil is much enlarged and produces a feeling of a foreign body in the throat, there is difficulty of swallowing and speaking on account of pain. If left to itself the trouble becomes aggravated until the abscess bursts which gives immediate relief. The pus is evacuated through the mouth, but if it bursts during sleep the pus might be inhaled and septic pneumonia might result. The treatment is to keep the mouth clean by antiseptic gargles and apply hot fomentations behind the angle of the jaw. Inhalation of steam impregnated with turpentine and eucalyptus oil (No. 34) is beneficial in relieving the feeling of discomfort. Opening the abscess as soon as pus is formed gives instant relief.

**Phimosis.** It is a condition in which the foreskin is long with a narrow orifice so that it cannot be retracted over the glans penis. It is usually congenital but may be acquired as a result of a venereal sore. In the former case the prepuce is often adherent to the glans and the orifice so narrow as to offer considerable resistance to the outflow of urine which causes back-pressure on the bladder and kidneys and damages them. The retention of the smegma, i.e., the secretion of the glans, causes irritation and discomfort and the child constantly pulls at the prepuce which may lead to self-abuse and produce nervous symptoms. Bed-wetting is common in children with a long foreskin. In grown up persons it forms an impediment to the performance of successful sexual act. The acquired variety is met with in adults as a result of a venereal sore.

If the orifice is not very narrow it is slit up a little with a pair of scissors to allow it to be drawn up or it is dilated with a pair of forceps, but the only satisfactory treatment is circumcision. In children it may be undertaken during the first year of life unless the orifice is so narrow as to require immediate relief.

**Paraphimosis.** It is a condition in which the foreskin with a narrow orifice is drawn over the glans penis and cannot be brought forward again. The margin of the orifice grips the glans tightly which becomes swollen and makes the condition worse. If left alone ulceration and sloughing take place or even gangrene of the glans. Before much swelling has taken place an attempt should be made to bring forward the foreskin by holding the body of the penis behind the constriction between the index and middle fingers of both the hands and gently pressing the glans back. Failing that the tight ring of the prepuce might be incised at one point and the skin drawn forward. Circumcision is advisable when the inflammation and swelling have subsided.

**Piles or Haemorrhoids.** Piles are the distended and varicose veins surrounding the lower inch or so of the rectum and the anal canal. They are covered above with mucous membrane and below with skin. They may be external or internal according to their situation without or within the anal orifice, though both are often present at one and the same time when they are known as mixed piles.

The external variety is rarely present alone and seldom gives rise to any trouble, except a little itching and a feeling of heaviness after defaecation. They are found round the anal margin and are covered with skin. Popularly, many conditions present about the anus are diagnosed as piles, such as fissure, fistula, anal warts, rectal prolapse, etc. Sometimes the dilated vein ruptures and a little bleeding takes place under the skin. Ordinarily no treatment is needed for external piles but they are removed if an operation for internal piles is undertaken.

Internal piles are more commonly met with in persons between 40 and 60, but other ages are not quite exempt. They are caused by any condition which brings about congestion of the liver, such as sedentary life, chronic constipation, abuse of alcohol, etc. In a chronic inflammatory condition of the liver called cirrhosis or any malignant growth in the abdomen which interferes with the return of blood from the rectum, as also the pressure of the gravid uterus in pregnancy, favour their formation. When recent they do not protrude outside the anus, but later they come out during defaecation and return after the act. In old cases and when they are inflamed they remain outside and can be pushed back with difficulty. When protruding outside they are apt to bleed from the surface capillaries and become painful. The bleeding continues as long as they are out and may be so persistent and profuse as to cause anaemia, weakness and depression. The symptoms are not very prominent until the piles begin to bleed or are inflamed on account of hard faecal matter or an irritant application to them as a remedy, as very often happens in India from the use of quack remedies. The inflamed piles are very painful and produce straining at stool and a feeling of a foreign body in the rectum. When prolapsed they are apt to be strangulated by the anal sphincter when they ulcerate and become infected and cause septicaemia or pyaemia.

In the early stages palliative treatment may prevent further progress of the trouble. The bowels should be regulated by mild purgatives (see Constipation), alcohol and rich or spicy food avoided and regular outdoor exercise taken to tone up the system. The local treatment consists in making use of astringent applications, such as gall and opium ointment alone or with an equal quantity of hamamelis (witch hazel) ointment (Nos. 109 and 110) two or three times a day or injecting into the rectum with a syringe liquid hazeline and keeping the piles clean and returning them when they have prolapsed. When they begin to bleed or become inflamed the best thing to do is to have them removed. The operation is very simple, painless and free from any risk and there is no chance of recurrence once they are removed. Many patients have an unreasonable fear of operation about the rectum and the quacks take full advantage of this and guarantee "certain cure" with their medicine without an operation and claim to extirpate the "roots" of the piles so that they won't recur. This is all absolute nonsense as the piles are nothing more than the dilated and varicose veins of the rectum and cannot possibly have any roots. There are only four or five sets of these veins and once they are all

removed there is nothing left to recur. Some other condition about the anus, such as warts, polypi, prolapse of the rectum, etc., which may occur after an operation for piles, is diagnosed wrongly by the patient as piles. The paste used by the quacks for the removal of the piles without an operation contains a caustic preparation of arsenic which sets up a strong inflammation and causes ulceration and sloughing. This is not only a very painful and prolonged treatment but is very dangerous and may cause death from shock, septicaemia, pyaemia or an abscess of the liver. The best that might happen after a prolonged and very painful treatment is the sloughing of the piles and the whole area round the anus resulting in an obstinate stricture of the anus from the scar which would require a much more severe operation.

**Prolapse of the Rectum.** It is a condition in which the rectum protrudes through the anal orifice. It is called incomplete when only the mucous membrane comes out and complete when the whole thickness of the bowel wall is involved. The condition is commonly met with in debilitated children or grown up women. In children any condition that causes straining is responsible for it, such as chronic constipation, prolonged diarrhoea, worms, phimosis, stone in the bladder or persistent cough. In women, who have borne children, the rupture of the perineum during child-birth which has been neglected is a common cause. The protrusion is small in the beginning and can be easily replaced but returns on coughing, straining or during defaecation. It gradually increases in size and on account of the constriction at the anal orifice it swells and becomes more difficult to replace and ultimately remains out permanently where it is exposed to friction and injury, as a result of which it becomes inflamed and ulcerates. In rare cases the sloughing and shedding of the protruded part takes place resulting in a spontaneous cure, but more often in such cases septic infection takes place which might extend to the peritoneum causing fatal peritonitis.

In the early stages when the size of the prolapse is small, the removal of the cause and palliative treatment are sufficient to effect a cure. The prolapsed part is cleaned and lubricated with sterilized vaselin and gently pushed back, a soft pad is then fixed with a bandage and the patient kept in bed for a couple of hours. Measures for the improvement of the general health are also adopted. In adults even after the removal of the cause the prolapse may persist and is likely to give trouble; it is therefore advisable to undergo radical operation for the fixation of the prolapsed gut.

**Prolapse of the Uterus.** In prolapse of the uterus, the womb is displaced in a downward direction into the vagina, or in severe cases a part or the whole of it projects outside the vulva. A neglected tear of the perineum during child-birth and a relaxed state of muscles favour its production. When complete, the whole organ is outside the vagina whose mucous membrane is everted and becomes dry and hard like the skin. The bladder may be dragged down causing pain and difficulty in passing water. If the prolapse is small and the perineum not much torn the wearing of a pessary is sufficient to keep the organ

in place but in more severe cases surgical help is necessary to fix the organ in its place and repair the perineum.

**Enlargement of the Prostate.** The prostate is a gland in the male situated round the neck of the bladder through which the first part of the urethra passes. It produces the prostatic secretion which is a constituent of the seminal fluid. After the age of 55 its functional usefulness is diminished and it begins to grow in size, and as it is situated round the exit from the bladder it is apt to cause obstruction to the flow of urine. The amount of obstruction does not depend on the size but on the degree of encroachment on the lumen of the urethra. The onset is very gradual and the progress slow but the obstruction progressively gets worse. The earlier symptoms are increased frequency of micturition, particularly at night, difficulty of commencing the flow, straining which hinders rather than helps the feebleness of the stream. The last part of the urine flows without any force and continues after the patient feels that the bladder is completely emptied. The constant strain on the bladder to force out the urine against the obstruction causes it to be distended. A small quantity of urine is always left in the bladder after micturition, and this residual urine gradually increases in quantity until the bladder is over-distended after which the urine constantly dribbles through the urethra. The accumulated urine in the bladder exerts a backward pressure on the kidneys, causes them to be distended and damages their function. Complete stoppage of urine might take place at any time from congestion of the prostate from cold, alcoholic excess or sexual indulgence. Cystitis, i.e., the inflammation of the bladder, takes place sooner or later, specially if catheter has been frequently used to draw the urine. The urine becomes decomposed and offensive and stone is formed in the bladder. The septic inflammation ultimately reaches the kidneys and kills the patient. In a certain proportion of cases the enlarged prostate becomes cancerous.

The proper treatment for an enlarged prostate is its removal before the health of the patient is impaired or septic infection takes place and damages the bladder and the kidneys. The operation is contra-indicated if the function of the kidneys is permanently damaged. In very early cases the operation is done in one stage and the prostate removed at the first sitting, but if there is infection of the bladder or the kidneys, and the latter do not function properly it is done in two stages. At first the bladder is opened to drain the urine from the wound and treat the septic condition and after some days when the condition has improved the gland is taken out. If for any reason the operation is not advisable regular catheterization is resorted to so as to empty the bladder. The catheter is sterilized by boiling and lubricated with a sterile lubricant and introduced after the part is well washed and cleaned with an antiseptic lotion, the hands of the operator are also thoroughly washed and sterilized before the catheter is handled. Even with all precautions septic infection takes place sooner or later.

**Stone in the Bladder.** A stone may form in the bladder from the

solid constituents of the urine precipitated under certain circumstances, or a small one may form in the kidney and descend into the bladder where it grows in size. Any foreign matter introduced into the bladder gets covered with incrustation precipitated from urine and forms a stone. It is very common in hot countries on account of the highly concentrated state of the urine due to loss of body fluids through perspiration. It is fairly common in children during the first decade of life and in persons over 40, but is rare in females. The composition of the stone varies in different cases and the symptoms produced depend on its size, shape, hardness, etc., and the sensitiveness of the patient. Pain is the prominent symptom which is felt after micturition at the end of the penis, in the perineum and the thighs. In children bed-wetting is common. Sooner or later septic infection of the bladder takes place, the urine becomes offensive and the stone increases in size. The condition can be diagnosed by feeling the stone with a specially made sound or by means of X-rays.

Once the stone is formed it cannot be dissolved by any means and has to be removed. This is done by breaking it up with a special instrument known as lithotrite and removing the fragments through a suction apparatus called an evacuator, when this is not possible, on account of the smallness of parts in very young children or large size of the stone, by opening the bladder above the pubis and removing the stone. The wound in the bladder heals within a fortnight.

**Stricture of the Urethra.** It is a condition in which the lumen of the urethra is narrowed or completely obliterated so that the flow of urine is hindered or completely stopped. It may be temporary due to a spasm of the urethra which occurs in acute inflammation or as a result of unskilful use of the catheter. It is relieved by rest, administration of sedatives and hot fomentations to the perineum or hot hip-baths. The permanent or organic stricture is due to the formation of a scar in the wall of the urethra on account of an injury or ulceration in chronic gonorrhoea. It may be partial when the flow is not completely stopped, or it may be complete. The partial variety is liable to become complete at any time. The patient has difficulty in passing water, the stream is narrow and it takes much longer to empty the bladder. A small quantity of residual urine is left in the bladder which gradually increases until the bladder is overfull and the urine constantly dribbles through the urethra. The back pressure of urine damages the kidneys and the septic inflammation from the bladder spreads to them. The dilated urethra above the stricture is liable to be ruptured when urine is forced into the soft parts of the perineum and causes them to slough.

The treatment consists in dilating the stricture before it becomes complete, by special sounds at regular intervals. If the stricture is impassable an early operation is the only treatment for it.

**Tumours.** A tumour is an abnormal new growth in the body which does not fulfil any physiological function. When it consists of a cavity filled with some fluid it is called a *cyst*. All solid tumours can be divided into innocent or benign and malignant or cancerous. An inno-

cent tumour is a growth, often enclosed in a fibrous capsule, usually solitary and structurally resembling the normal tissues of the body. It does not disseminate to other parts of the body but produces local effects only on account of the pressure exercised on the adjoining organs. It may become dangerous only when it grows in the vicinity of a vital organ, such as heart, lungs, air-passages, brain, etc. When it is removed it does not recur; occasionally a benign tumour after growing for some time becomes cancerous.

There are many kinds of benign tumours and they are named according to the tissues of which they are formed, e.g., lipoma or a fatty tumour consists of fat; fibroma consists of fibrous tissue; condroma is a cartilagenous tumour; osteoma is a bony tumour; odontoma grows from a tooth; neuroma from a nerve; myeloma from the bone marrow; angioma from blood vessels, and myoma from a muscle. The treatment is to remove the tumour before it grows big and gives trouble.

**Malignant Tumours.** They are called malignant because they grow rapidly, not only locally and infiltrate into the adjoining tissues, but are disseminated early to other parts of the body where they invade vital organs and destroy life. They originate from the normal tissue cells which soon lose their normal character and reverting to the embryonic type multiply indefinitely without any control. Some of these cells get loose from the original growth and are carried in the blood or the lymph stream to distant organs where they multiply and form new growths which are called *metastasis*. These secondary growths are in inaccessible parts and continue to grow unhampered even if the original tumour is removed. There are two kinds of malignant tumours known as *sarcoma* and *carcinoma* or *cancer*.

**Sarcoma.** A sarcoma originates from the connective tissue cells of an organ or any part of the body; these cells bind and support various structures in the body. Sarcoma is more common in young persons, even very young children are liable to get it. It is very vascular and its dissemination takes place through blood vessels which consist of wide channels between the masses of rapidly growing cells. The metastasis, i.e., the secondary growths, are found mostly in the lungs and the heart at an early stage, they are, therefore less amenable to surgical treatment than carcinoma. Some sarcomas are amenable to radium treatment provided it is given very early.

**Carcinoma** or Cancer. Carcinoma originates in the epithelium, i.e., the layer of cells covering the skin, mucous membranes and the alveoli of secreting glands. These cells under normal conditions just cover the surface, but when they become cancerous they become embryonic in type, multiply indefinitely, infiltrate into the adjoining tissues and are carried through the lymphatic channels to distant organs of the body where they multiply and form secondary growths and destroy life. Carcinoma is not frequently met with before the age of 30, its incidence increasing after that age. Very often the exciting cause is some prolonged irritation of the part, such as that caused by a jagged tooth rubbing against the tongue, or by the stump of a clay pipe constantly pressing against the lip. In the male the parts most fre-

quently attacked are the stomach, tongue, intestines and prostate, while in the female the breast; uterus and gall-bladder are more often affected. Its malignancy, i.e., the rate of growth and dissemination, varies in different cases, and as a rule, the younger the patient the more rapid the progress. In some old patients the process is very slow and goes on for years without seriously affecting the health, but such cases are few.

All malignant tumours, unless extirpated at an early stage, are invariably fatal and so far no medicine has been known to have any effect on the progress of the disease, much less to cure it in spite of the bragging claims made by some quacks and unqualified practitioners. These heartless men thrive on other people's suffering, because, like a drowning man, a cancer patient in extreme agony whose condition is pronounced hopeless, will catch at a straw to save himself, as hope rules supreme in human breast. Immense fortune and honours await the man who discovers a remedy to cure cancer without an operation. Intensive research, on which millions of pounds are being spent annually, is being carried out in many countries and it is quite possible this terrible scourge will, sooner or later, be conquered. In the meantime an early operation affords the best chance to the patient, provided the cancer is in an accessible place. Cancer of some of the commonly affected organs is described in this place.

**Cancer of the Skin.** This appears as a warty growth or a small nodule which soon increases in size and in course of time forms a fungating ulcer with irregular raised margins. It spreads to deeper parts and becomes infected and offensive. A very slowly but obstinately spreading cancer of the skin found in old persons, attacks the face and is known as *rodent ulcer*. It spreads locally, destroys the underlying bone and even the eyeball but disseminates slowly. It is very amenable to treatment by radium.

**Cancer of the Breast.** It is usually met with in patients after the age of 40, but may occur in younger persons. It is more common among the civilized races and is attributed to badly fitting stays or to some injury. It may originate in breasts with chronic inflammation or cracked nipples. It appears as a small, hard lump in the substance of the breast, which, in the beginning, is neither tender nor painful and is, therefore, apt to be neglected in the early stage when the chances of its being extirpated are good. It encroaches on the skin and produces a fungating ulcer. Pain, which is absent in the beginning, soon appears and becomes a very distressing symptom and in addition to constant dull aching there is neuralgic pain in the shoulder and arm. The disease progresses without any remission until the patient succumbs to extreme exhaustion from pain, sleeplessness and loss of weight. The only treatment that is likely to give the patient a chance is an early operation; for this purpose professional help should be obtained as soon as a lump is felt in the breast or in case of cracked nipples or chronic inflammatory condition of the breast. The lump may not be due to cancer but it is safe to make sure before it is too late.

**Cancer of the Womb.** It is more frequently met with after the age

of 40 in women who have borne children. The earlier symptoms are bleeding and discharge from the womb with hardly any pain. The bleeding is during menstruation at first and may be profuse and continue for a longer period than usual, but later it is independent of menstruation. The discharge also increases in quantity and becomes offensive, pain soon makes its appearance and becomes unbearable. The only treatment that is likely to be of any use is the removal of the womb before the disease spreads to other parts, but unfortunately this is not always possible as women generally do not like to be examined until the condition becomes very troublesome and painful. Irregular and excessive bleeding is fairly common at the time of menopause but in all cases of bleeding, to be on the safe side, a gynaecologist should be consulted without any delay. Even when there is no chance of saving the patient's life in advanced cases, the removal of the uterus will relieve the patient of much suffering and pain provided she is fit to undergo the operation.

**Cancer of the Tongue.** It is more frequently met with in men than in women and is brought on by prolonged irritation from a carious tooth, badly fitting tooth-plate, excessive smoking, and in India from constant chewing of betel-nut with tobacco and lime. It appears as a small wart, a nodule or a hard patch on the mucous membrane, usually on the margin. It increases in size, infiltrates into the floor of the mouth and fixes the tongue so that speaking and swallowing become difficult and painful. The pain is intense and constant and with want of nourishment and sleep brings on early exhaustion. Very early exposure to radium is found to be beneficial locally but on account of very early infiltration it does not arrest the progress of the disease. Removal of the tongue may relieve pain and suffering and enable the patient to take nourishment.

**Cancer of the Stomach.** It is more common in cold than in warm countries and in the male than in the female. It usually attacks persons between the ages of 40 and 60. It sometimes develops in a chronic ulcer but may start independently. The earlier symptoms are indefinite so that its presence is not suspected until very late. They are loss of appetite, a sense of fullness after food, and pain which is mild in the beginning but later on becomes severe and is felt in front and back and is independent of meals. Later, vomiting sets in and the vomited matter contains some blood which may be so little as to be detected on chemical examination, but when the disease has advanced it is profuse and the vomited matter is pure blood. The patient loses flesh and soon becomes exhausted from pain, sleeplessness and want of nourishment. Unfortunately, it is not possible in a large majority of cases to diagnose the condition until the disease has advanced too far. When the disease is localized and detected early the affected part of the stomach can be removed.

**Cancer of the Intestine.** The colon, i.e., the large intestine, is much more frequently attacked than the small intestine. It progresses slowly and does not disseminate early. The earlier symptoms are not typical and the disease is likely to have advanced considerably before its presence

is suspected. The patient has either constipation or diarrhoea or these alternate with one another, colicky pains and some blood in the stools which is only detected on chemical examination. The symptoms become gradually more pronounced and the patient loses weight and strength. As the growth encroaches on the lumen of the bowel the signs of obstruction slowly develop or it may come on suddenly without any previous warning. If the disease is detected early the diseased part of the bowel can be removed and the lumen restored, failing that if the obstruction is complete an artificial anus is made by making an opening in the bowel above the site of the disease and stitching it to the abdominal wall.

**Cancer of the Gall-bladder.** This is more common in women than men and originates in a gall-bladder that has been subject to chronic septic inflammation or stones. It is painless to start with and grows slowly remaining localized for a long time. It can be felt, when sufficiently large, as a hard tumour projecting below the margin of the ribs on the right side. The patient may have a little jaundice, loses flesh and complains of a feeling of discomfort which is worse after meals. Removal of the gall-bladder is possible with fair prospects of a cure if the operation is undertaken early.

**Cancer of the Prostate.** This occurs in elderly men between the ages of 55 and 70 and often starts in the senile enlargement of the gland. To start with it produces the same symptoms as the enlarged prostate (*q.v.*). It progresses fairly rapidly and involves the bladder, rectum and the surrounding parts and is accompanied with pain, difficulty of passing water and blood in the urine. The pain is felt not only in the bladder but in the back and down the thighs and legs. The removal of the gland before it is too late offers fair prospects of a cure, but unfortunately the condition is not always detected in time. The application of radium to the cancerous prostate by means of specially made instruments and the injection of some gonadic hormones have produced good results.

**Cancer of the Larynx.** It occurs mostly in males after the age of 40. The earlier symptoms are hoarseness which increases gradually until the voice is completely lost, dry irritating cough, expectoration of blood-stained mucus and later on pain. The disease spreads to the adjoining parts and to the base of the tongue. Sooner or later infection takes place and the patient is carried away by septic pneumonia. In the beginning when the disease is localised it is possible to remove the larynx. The application of radium before the disease spreads arrests its progress.

Cancer attacks all other organs of the body and in every case behaves in the same way as described above, viz., a rapid growth locally, early dissemination to other parts of the body with the same general symptoms and local symptoms referable to the part affected, requiring the same line of treatment and in a large majority of cases having the same unfortunate termination.

**Varicose Veins.** The term is applied to a condition in which a vein becomes permanently dilated, tortuous and elongated. It most commonly

affects the large veins of the lower extremities; a similar condition of the spermatic veins in the scrotum is known as varicocele (*q.v.*) and that of the veins surrounding the lower part of the rectum as piles (*q.v.*). It is due to some inherited weakness of the venous walls and is often present in many members of the same family. It is brought on or aggravated by prolonged standing, wearing tight garters or the pressure on the veins of a tumour or of gravid uterus. It usually appears between the ages of 15 and 30. When slight it does not cause any symptoms, but when advanced the patient has a sense of heaviness, pain and fatigue on standing or walking which disappear on lying down. Any slight injury or even scratching causes eczema and ulceration and sometimes profuse bleeding from the injured vein. In some rare cases the injury causes intravenous clotting which results in a spontaneous cure.

If the patient has not much standing or walking to do and there is not much pain palliative treatment will be sufficient. It consists in avoiding wearing garters, not walking or standing for long, gentle massage in the direction of the venous circulation and wearing elastic silk stockings or thin rubber bandages. These are applied in bed before the patient gets up and taken off when he lies down. If an ulcer has formed the patient should remain in bed until it heals. Radical operation for the removal of the varicose veins is advisable if the condition is very painful, if frequent ulcers are formed and if the patient has to do much walking or standing. Injection into the veins of certain chemicals, such as quinine, urea, salicate of sodium, etc., in order to produce clotting has been done but the result is seldom satisfactory.

**Whitlow.** The term is applied to a suppurative condition met with in fingers caused by some septic infection through a wound which may be very trivial. If the suppuration is superficial a small painful purulent blister is formed which subsides as soon as the cuticle covering it is incised to let out the pus as soon as it is formed. The suppuration may take place under the skin when it extends into the palm and forms an abscess. It is very painful, the pain increasing when the hand is kept hanging down. Its treatment is the same as for an abscess, viz., hot boric fomentations and an incision as soon as pus is formed. In a more severe variety the infection of the tendon sheaths of the fingers takes place which extends into the palm and the forearm and unless the pus is let out early it destroys the tendon sheaths and may infect the wrist joint resulting in the stiffness of the joint and fingers. It is accompanied with much pain and general constitutional symptoms. In such cases very early incisions are necessary to prevent the extension of the infection and destruction of the tendons. The administration of sulpha drugs or penicillin in time is helpful in preventing the extension of infection.

## CHAPTER XIII

### PREGNANCY AND LABOUR

Pregnancy is a normal physiological condition in women between puberty and menopause. It is very rare before puberty and more so after menopause. There have been cases in which pregnancy has occurred at the age of nine or so, in such cases menstruation has commenced at an abnormally early age. In India, some cases of pregnancy under nine have been published, but as there is no strict birth registration and illiterate people do not keep a record of their own or their children's date of birth such cases of pregnancy occurring at supposedly very early ages are among under-developed girls who look much younger than their age.

**Duration of Pregnancy.** The duration of pregnancy is calculated from the last day of the last menstrual period and is taken to be 280 days, but it varies within certain narrow limits. If it is less than 265 days it is said to be a case of premature delivery. In some cases scanty menstruation appears for a month or two even after conception has taken place, in which case the time calculated as above is very short, but the foetus, as a rule, is fully developed at the time of delivery. If the period exceeds 290 days it is said to be a case of prolonged gestation. In such cases the foetus is likely to be abnormally large. As pregnancy is likely to take place during amenorrhoea from any other cause, the period of gestation as calculated from the last menstrual period may seem abnormally prolonged in such cases. It is not possible to make a calculation from the time of conception which does not necessarily take place soon after a successful coitus as the spermatozoa may remain alive in the genital canal of the female for about two weeks or so after they are deposited there and the ovum may be fertilized at any time during the period. The ovum is discharged from the ovary about the 14th day in a 28-day menstrual cycle and unless fertilized within two or three days it dies and is disintegrated. When fertilized it attaches itself to the mucous membrane of the womb and begins to grow and the pregnancy commences from that time.

**Hygiene of Pregnancy.** Pregnancy being a normal physiological function does not require any special treatment with the exception of a few necessary precautions; the usual mode and habits of life should be continued provided they are not unhealthy. It is very advisable to take outdoor exercise provided no violent games are indulged in, so as to keep up the tone of the muscles, as a good deal of muscular effort is required during labour. Working-class women, whose muscular system is kept in good condition by regular outdoor physical work, go through their confinements without much difficulty and are free from many complications to which case-loving women of better classes are subject. Fatigue, late hours, overloading the stomach, sudden and violent efforts, carrying heavy weights, riding, and all kinds of mental worry should be avoided. Walking is the best exercise and can be indulged in till the end. The living room should be well-lit and

properly ventilated and the woman should be exposed to mild sunlight as much as possible. The diet should be plain and nourishing and should include milk in sufficient quantity as it supplies not only the additional nourishment required for the building up of the body of the foetus, but contains the necessary calcium, other salts and vitamins. Many pregnant women get a craving for abnormal articles of food; this should not be indulged in unless the article is wholesome and not too spicy and difficult to digest. The food should be taken at regular hours and eating between meals should be avoided. Constipation, if present, should be remedied by diet, exercise and very mild aperients (see Constipation); castor oil and other strong purgatives should not be taken. Plenty of water, barley water and other bland fluids should be taken so as to flush out the system. Medicines should be avoided as much as possible, especially sedatives and patent remedies.

The body should be protected against cold by suitable clothing which should be loose and hang from the shoulders, tight corsets and stays should not be used as also garters or tight bands round the legs as they are apt to retard the circulation from the lower limbs and cause varicose dilatation of the veins and produce clotting of blood in them (thrombosis) during confinement. The breasts should be lightly supported if they tend to hang loose and the nipples should not be subjected to pressure of any kind. They should be washed daily with soap and warm water and dusted with starch and boric powder. In case they are soft and tender they should be washed with spirit or diluted eau-de-cologne and exposed to air for a few minutes at a time.

It is advisable to consult an obstetrician once a month from the third or the fourth month and have the urine regularly examined for the presence of albumen or any other abnormal substance, as it is a danger signal and requires early precautionary measures against eclampsia, i.e., convulsions of the pregnant and lying-in woman which is a great danger to the life of the mother and the child. The obstetrician will also take the measurements of the pelvis and in case of an abnormality will be able to adopt early measures against protracted or obstructed labour. He will also make sure whether the pregnancy is running a normal course.

**Signs of Pregnancy.** These may be divided into symptomatic or indirect and physical or direct; the former are noticeable during the earlier part of pregnancy, and the latter, which are due to enlargement of the womb caused by the growth of the foetus, can be elicited during the later half. There are other laboratory tests also which require technical skill to carry out. The symptomatic signs are: suppression of menstruation, morning sickness, fullness, swelling and tenderness of the breasts, the enlargement of the coloured area round the nipples, and irritability of the bladder. The presence of any one or all these together cannot be taken as definite or conclusive evidence of pregnancy but only a presumptive one. The physical signs are: enlargement of the abdomen, quickening of the child, ballotment and the presence of foetal heart sounds.

Amenorrhoea or suppression of menses occurs from the very beginning.

In very rare cases menses may continue for a month or two but the flow is scanty in such cases. Profuse flow during pregnancy is due to some pathological condition and requires very early investigation. Amenorrhoea in a young healthy woman who has been menstruating regularly is a strong presumption of pregnancy. In some women temporary stoppage takes place soon after marriage or in unmarried women after illicit sexual intercourse without pregnancy, which is due to psychological causes. The morning sickness of pregnancy is usually more marked during the first pregnancy, but some women get it during subsequent pregnancies also. It commences during the second month, viz., after the first suppressed period. Nausea and often vomiting occur in the morning when the woman rises from bed and subside as the day advances and there is no further trouble during the rest of the day. It continues for about eight weeks, rarely longer, but in some women it is very severe, lasts for months and affects the general health. Except in such cases no special treatment is necessary. The breasts become full and tender from the first month; this is more marked in the first pregnancy. The enlargement steadily increases as the pregnancy advances and is well marked during the later months. The nipples become erect and prominent and the coloured area round them increases in size and becomes darker. There may be some irritability of the bladder during the second month with frequency of micturition and some pain or a sense of discomfort while passing water. This trouble disappears soon after the third month when the womb rises out of the pelvic cavity.

The physical signs are noticeable from the fourth month when the womb rises above the pubis where it can be felt. The enlarged womb can be felt with the flat of the hand gently pressed above the pubis when the woman is lying in bed on her back with the thighs flexed so as to relax the abdominal muscles. During the fifth month it is midway between the pubis and the navel and reaches the navel during the sixth month and is halfway between the navel and the margin of the ribs during the seventh, and reaches the lower end of the breast bone during the eighth. In the last month of pregnancy it comes down a little in the erect position of the woman as the womb sinks a little into the pelvic cavity.

Ballottment can be elicited during the fifth month and becomes more marked as the pregnancy advances. The foetus in the womb is surrounded by fluid and when the woman is in the standing position it rests on the lowest part of the womb; if a gentle push is given upwards on the abdominal wall with the fingers the sensation of its floating away can be felt and also its return as indicated by a gentle impact against the abdominal wall. This is known as external ballottment. Similar sensation can be felt per vaginum which is known as internal ballottment, but it is not advisable for a layman to try it.

Foetal movements known as quickening are felt by the woman herself after the end of the fourth month. Later they can be felt from the outside by placing the hand on the abdomen. These are due to muscular movements of the foetus. Sometimes, especially during the first preg-

nancy, they produce disagreeable sensations.

A very important and conclusive sign that can be obtained during the seventh month and after, is the foetal heart sounds, which becomes more prominent as the pregnancy advances. It not only provides a very definite evidence of pregnancy, but also shows that the foetus is alive. These sounds are clearly heard with a stethoscope, but can also be heard by applying the ear directly to the abdominal wall on one side, usually the left, midway between the pubis and the navel. It requires a little practice to be able to hear them. When first heard their frequency is between 140 and 160, but it is reduced to 120 to 140 a minute.

**Labour** or Child-birth is the process by which a full-term foetus is expelled from the womb. The expulsion is brought about by involuntary intermittent contractions of the uterine muscular fibres accompanied with pain of a colicky nature. The intensity of pain varies and is more severe during the first confinement and in some sensitive women. Before the commencement of labour many women get pains of short duration every evening for a few days, which ultimately merge into labour pains. False labour pains occur some time before the onset of labour, but they do not last long and are due to indigestion, constipation or some other disturbance. They are not accompanied with what is known as the "show" which is a slightly blood-stained discharge of mucus and which is an indication that the labour has already commenced and it is time to send for the accoucheur if he is not already present.

The labour is divided into three stages. During the first one the maternal passages are dilated by the protrusion of the "bag of waters." This consists of the membranes surrounding the foetus and the fluid in which it floats. During the second stage, which commences when the parts are dilated and the bag of membranes ruptures and allows some fluid to escape. The first stage is much prolonged during the first confinement and may last from 16 to 24 hours, but in subsequent pregnancies it is very much shorter. During the second stage the birth of the child takes place which is assisted by the voluntary contraction of the abdominal muscles or "bearing down" by the patient. This stage lasts from two to three hours during the first delivery while it may be a few minutes during subsequent ones. During the third stage the delivery of the placenta, i.e., after-birth, takes place. This is followed by some bleeding which comes from the raw surface in the womb where the placenta was attached. In normal cases it soon stops as the contraction of the womb closes the open blood channels. In case the contraction is deficient or absent very severe or even fatal bleeding takes place unless very prompt measures are taken. The third stage lasts from a few minutes to an hour or so. It is not advisable to use great force in an attempt to squeeze out the placenta, but to rub or squeeze the womb gently from outside and wait until it is delivered.

**Preparation and Management of Labour.** As there are special lying-in hospitals or wards in many cities it is very advisable to make arrangements beforehand in one of the institutions, because in a hospital every care and precautions are taken against all contingencies and medical

help is immediately available in an emergency. The strong prejudice against such hospitals is now dying out in India and even the most backward classes now take advantage of such institutions. If it is decided to conduct the labour in the house, a well-lit and well-ventilated room with an attached bath-room should be selected and arrangements made for a plentiful supply of hot water. The bed should be kept, if possible, in the middle of the room so as to have plenty of free space all round. The room should not be too cold or too hot and should be painted or white-washed a few days before the expected time of delivery. The floor should be scrubbed and washed with soap and water and flushed out with some strong antiseptic lotion; cresol, lysol or carbolic acid lotion may be used for the purpose. This should be repeated as soon as the labour commences. The engagement of the nurse should be left to the accoucheur, but if one is engaged privately, it should be ascertained that she is not suffering from cold or influenza or has not attended on a case of septicaemia, pyaemia, scarlet fever or any other infectious disease within four or five weeks before the confinement, as a lying-in woman is very susceptible to infection which may prove very dangerous or fatal.

There should be a plentiful supply of surgical absorbent cotton-wool, clean towels, napkins, bed-sheets, binders, some antiseptic lotion, lysol being commonly used for labour, and a couple of blankets. The mattress should be covered with a large waterproof sheet so as to prevent it getting soiled. In hospital all these are sterilized so as to do away with the risk of infection from them. An enema syringe, an irrigator which is boiled with the tube and the nozzle, a bed-pan and a feeding cup should also be available. Three doses of ergot and quinine mixture (No. 76), some ampoules of pituitrin or infundibulin and a hypodermic syringe and arrangements for sterilizing it should also be kept ready as also some tincture of iodine for sterilizing the skin (see Hypodermic injection, page 218, Part I).

As soon as the signs of commencing labour become manifest the woman should pass urine and have an enema if she has not passed motion within four or five hours. The external genitals should be cleaned thoroughly with soap and warm water and bathed with lysol lotion. During the first stage when the parts are being dilated it is not necessary for her to lie in bed but to move about in the room and rest in an easy chair occasionally. When in bed she should be on her back as much as possible and refrain from bearing down at this stage. When the parts are fully dilated the bag of waters presents itself at the vulva and soon ruptures allowing some of the liquid to escape, the head, fitting tightly in the opening, acts as a ball-valve and prevents its further escape. The second stage of labour, i.e., the birth of the child, commences from this time. A large towel or a bed-sheet is tied to the head of the bed so as to enable the woman to pull on it during the contractions of the womb and help her in bearing down efforts. If the pains are severe with strong contractions the head of the child is likely to be pushed down rapidly through the outlet of the vagina before it is fully dilated and cause extensive rupture of the perineum which may

extend into the anus. This is very likely to happen during the first confinement. It is therefore necessary to support the perineum and prevent the head emerging too rapidly. This is done by pressing the perineum with the palm of the hand, the thumb and the fingers pressing on either side of the outlet. When the head is forced down against the hand during a strong contraction it is gently pressed back and slightly against the pubis so as to prevent its rapid delivery and give time to the soft parts to dilate gradually. The parts should be frequently bathed in warm lysol lotion during the intervals between the pains. Before supporting the perineum the hand should be well washed and soaked for some time in lysol lotion.

As soon as the head is delivered it is supported and gently withdrawn as the rest of the body comes out without difficulty. The child is handed over to the nurse who clears the mouth and nostrils with a clean piece of lint or gauze so as to remove any mucus or liquid that might obstruct the breathing. It is then placed on its back and if it has not cried already or started breathing, a little cold water is dashed on its face and body and if the breathing is much delayed it is placed alternately in hot and cold water and artificial respiration commenced. The beating of the child's heart can be felt in the cord which stops when the placenta is detached from the uterine wall. The cord should not be cut immediately after the birth but should be allowed to remain attached for some time until the pulsations in it have stopped. A piece of thick thread, preferably silk which has been boiled and kept in lotion, is used for ligaturing the cord. It is securely applied about an inch and a half from the navel and another about two inches from it on the side of the placenta. The cord is then cut between the ligatures with a sterilized pair of scissors which is kept ready for the purpose. The child's end is dusted with a little boric powder and dressed with a clean pad and bandaged. This drops off by itself in a week's time.

While the assistant attends to the child the nurse gently massages the womb by squeezing it in the right hand so as to stimulate its contraction. After the birth of the child it is felt as a hard body just below the navel. The contraction causes the detachment of the placenta and expels it into the vagina from where it can be withdrawn with a gentle pull so that the membranes may be detached and withdrawn without being torn and its pieces left behind. There is a gush of bright red blood as soon as the placenta is expelled but this soon stops if the contraction of the womb is maintained. To stimulate the normal contraction one ounce of ergot and quinine mixture (No. 76) is given by the mouth as soon as the placenta is detached, but not before. It takes about half an hour to act, it is therefore necessary to watch the womb and continue gentle massage until the above mixture begins to act. If there is an urgency and an immediate effect is required on account of excessive bleeding an intramuscular injection of 1 c.c. of pituitrin or pituitary extract is administered which has a powerful effect on the uterine muscular fibres. Unlike ergot pituitrin can be given earlier and during the second stage of labour to expedite the delivery of the child when the soft parts are fully dilated and after

making sure that there is no mechanical obstruction in the pelvis. It is not advisable to give it in first confinement during the second stage as rapid delivery is very harmful and might cause extensive rupture of the perineum. It could be safely given after the birth of the child.

Before the placenta is disposed of it should be carefully examined, especially the raw surface to see if it is complete and no part of it or of the membranes is left behind. During the delivery of the placenta the bag of membranes is everted, it should be turned over and examined to see that the whole of it has come out. All soiled linen and blood clots are removed and the external parts washed with warm lysol lotion. The external genitals are also examined, particularly the back part of the vaginal outlet to see if there is a rupture. A small rupture is usually present in almost all cases which requires no particular treatment except keeping it clean. If the tear is a large one it is necessary to put a couple of stitches to bring the raw surfaces together. When all this is completed a clean sterilized pad is applied and fixed with a T bandage. In normal cases when there has not been much interference it is not necessary to douche the vagina, but in case of prolonged and difficult labour a douche of warm lysol lotion is given. The can, rubber tubing and the nozzle should be well boiled before use so as to obviate the risk of introducing any contamination from outside. A large soft pad or a folded towel is placed on the abdomen and a broad binder applied so as to keep it in place. The patient is then given warm milk, broth or some liquid nourishment and allowed to rest.

After delivery a discharge, known as lochia, flows from the vagina for about two weeks, which consists of a thin bloody fluid for the first two days or so, after that it becomes brownish in colour and by the end of the first week it is yellowish green and becomes white before stopping and has a mild unpleasant odour. During the lying-in period which is known as puerperium the woman requires complete rest in bed, after the second day she might be propped up with a bed-rest or pillows. Women who had prolonged or difficult labour or had excessive bleeding require much longer rest. A mild purgative should be given on the second day and repeated, if necessary, every other or every third day. The bladder requires attention, especially after prolonged or difficult labour, as in such cases there is retention of urine and the use of a catheter becomes necessary. A rubber catheter, which is well boiled and lubricated with sterilized oil, should be used to relieve the bladder two or three times a day. The external genitals should be washed and cleaned with some antiseptic lotion. The womb takes about six weeks to resume its original size and it is not advisable for the woman to undergo much physical exertion during the period, she should remain in bed as much as possible as otherwise displacement of the womb or prolapse might take place.

**Abnormal Labour.** The labour is said to be normal in which the vertex, i.e., the top of the head of the foetus, first appears at the outlet and in which the delivery takes place without any difficulty and without any artificial help. Any case, in which any other part than the vertex presents or there is any complication requiring artificial

help for the delivery of the foetus, is one of abnormal labour. The abnormality may be due to several causes, such as a faulty action of the womb, abnormal presentations, abnormal conditions of the maternal passages, prolapse of the cord before the delivery of the child, bleeding before delivery, excessive bleeding after delivery, retention of the placenta and eclampsia, i.e., the convulsions of the pregnant or lying-in woman. All these conditions are dangerous to the life of the mother and the child unless the trouble is foreseen before delivery and suitable precautions taken or very early professional help obtained during labour. For this reason it is advisable to arrange for the delivery in a hospital or engage the services of an obstetrician. Below is a short description of some of the common abnormalities.

(1) Faulty action of the womb. Precipitate labour usually takes place in women who have borne children before, in which the pains are feeble and not felt by the woman who does not take to bed but moves about. The sudden delivery of the child might take place when she is in the standing position and it might receive fatal injuries by the fall or, as sometimes happens, the child might be delivered in the bath or the water-closet and if she faints from bleeding, it is liable to be suffocated and the woman might get fatal bleeding.

The labour may be unduly prolonged on account of feeble contractions of the uterine muscle and long and irregular intervals between pains. This happens when the woman is in poor health or the womb is overdistended from excess of fluid or from the presence of twins. It may occur during the first delivery in nervous women. Unless early help is given the woman is liable to be exhausted from want of sleep. The labour is prolonged when there is an obstruction in the maternal passages or there is an abnormally large size of the foetus on account of unduly prolonged gestation or malformation of the child. The usual deformity causing obstruction to labour is the distension of the head on account of accumulation of fluid in it. In obstructed labour normal delivery is impossible and unless early professional help is available the woman dies of exhaustion.

(2) Abnormal presentations are those in which, instead of the vertex first appearing, other parts, such as the face, breech, i.e., buttocks, leg, shoulder or hand appear at the outlet. Normally the head of the child is well flexed on the chest so that the chin touches the breast-bone and the short axis of the head, viz., the one passing through the centre of the forehead and the centre of the back of the head, passes through the pelvis, but if for some reason the head becomes extended the longest axis of the head, viz., the one passing through the point of the chin and the top of the head, is thrown across the pelvis so that the extended head gets jammed in the pelvis. This abnormal presentation can be rectified if recognized in time or else delivery has to be effected by means of forceps. In breech presentation on account of the abnormal position of the foetus in the womb the breech first appears. In such cases the body is delivered without much difficulty, but when the head is expelled from the womb it remains in the dilated vagina as there is no muscular power from behind to push it

out. If not delivered in time by artificial help the child is liable to be suffocated. In such cases the head is extracted by a gentle pull on the body in such a way as to keep the head flexed on the chest. A simple method to effect the delivery of the head is to hold the child between two hands, one in front of the body and the other behind. The fingers of the hand in front are hooked over the shoulders so as to be able to pull the body in the downward direction, while those of the hand on the back are extended as far as the back of the head which is pushed forward so as to keep it flexed during the pull which is directed in such a way as to prevent extension of the head. There should be no undue haste or force. The child might require artificial respiration if there has been much delay in delivering the head. In breech presentation sometimes one leg comes down first, in which case it should not be pulled to hasten delivery as the parts are not properly dilated and the child is liable to be injured. The labour should be allowed to proceed until the parts are dilated and the body is born. It may be necessary to bring about the delivery of the body and the head by means of forceps if there is much delay. In case of twins both the children are small and usually there is no difficulty, one is delivered by the head and the other by breech presentation, unless they are interlocked when it becomes a case of obstructed labour and needs early help.

Shoulder presentation or cross birth is one in which on account of contracted or deformed pelvis the head is unable to enter it and the child lies more or less across the womb in a horizontal position and the part to present is one of the shoulders and when the waters escape one arm prolapses and appears at the outlet. Natural delivery is quite impossible in such cases and unless very early help is given the child soon dies and the life of the mother is in great danger.

The prolapse of the cord might take place with the escape of "waters," especially if it is too long and before the head fills up the pelvis. In such cases it is liable to be pressed between the pelvic wall and the head and cause the death of the child from asphyxia on account of the stoppage of circulation. It has to be replaced inside the womb as soon as possible by means of a special bougie and the foot of the bed raised very much so as to keep the cord down by the action of gravity. This can also be done by putting the woman in what is known as knee-elbow or better in knee-chest position as soon as the cord is replaced. The woman supports her body on the knees and elbows or on the knees and chest which rests on a soft pillow. In this posture the top of the womb is kept in the lowest position and the cord gravitates down to it. It is difficult to maintain this position for long but might be kept off and on until the head is fixed in the pelvis.

Another serious complication which is likely to occur is serious bleeding before delivery and before the parts are dilated. The bleeding may not appear on the outside but may burrow behind the placenta and the membranes; in such cases it is known as concealed bleeding and is very dangerous as, unless a careful watch is kept during labour,

it might escape notice until it becomes dangerous. The ante-partem bleeding, as it is called, is due to premature separation of the placenta when this is situated low down in the womb. The child dies of suffocation from stoppage of circulation and the life of the mother is in great danger from bleeding as the open channels where the placenta is separated from the uterine wall cannot contract and get obliterated as the womb cannot contract until the child is delivered. Very early professional help is necessary in such cases to save the life of the mother. The bleeding from the womb after the birth of the child, if it is continuous and excessive, is due to want of proper contraction after delivery. This has been referred to before.

Obstructed labour, which has been referred to before, is due to some mechanical obstruction in the pelvis, womb or maternal passages. In the pelvis it may be due to a bony or other growth or deformity; in the womb and the maternal passages it may be due to a malignant or non-malignant growth or thickened and undilatable mouth and neck of the womb, and in the foetus it may be due to malformation, excessive pathological enlargement of the abdomen or an enlargement of the head from accumulation of fluid in the cranial cavity. A faulty position of the foetus, as in cross-birth, causes a serious obstruction in labour. In the first delivery in elderly women generally after thirty there is a certain amount of obstruction on account of stiffness of soft parts which do not dilate readily. In such cases delivery might take place after a prolonged labour with much tearing and laceration of soft parts or artificial help may become necessary.

Retention of the placenta is another complication of labour which, unless skilfully treated, may become dangerous. Usually the placenta is delivered within a few minutes after the birth of the child, but even in normal cases it may take about an hour during which period nothing should be done except to massage the womb through the abdominal wall as described before, unless bleeding takes place, in which case immediate help is necessary to save the life of the mother. On no account should the cord be pulled as it is liable to break, or what is more serious it might cause inversion of the uterine wall, i.e., turning the womb inside out. The retention is due to want of contraction of the womb after delivery or due to an irregular spasmodic contraction forming a ring below the placenta or due to some abnormal condition which makes the placenta more adherent than usual. If it is not expelled after an hour or so it will have to be removed by hand with all aseptic precautions. Great care, gentleness and an accurate knowledge of the anatomy of the parts are necessary otherwise damage to the uterine wall, retention of a part of the placenta, and septicaemia are likely to result, all of which are very dangerous and likely to end fatally.

Another serious complication which is likely to occur before, during or after labour is eclampsia, i.e., convulsive seizures. This can be guarded against to a great extent by periodic examination of the pregnant woman. It is a dangerous condition and the death rate among the new-born is very high and the life of the mother is not free from

danger.

Puerperal septicaemia was at one time a fairly common and usually a fatal complication of puerperium, i.e., the lying-in period, but under the present strict aseptic routine followed it has become much less common than before and the mortality rate is much reduced by the modern treatment with sulpha drugs and penicillin. The infection is conveyed to the raw surface in the womb or any injury or laceration of other parts by contaminated hands, linen or instruments, or it may result from auto-infection from a septic focus in the body of the woman. Persons suffering from cold or influenza are a real source of danger in the lying-in room, as dangerous micro-organisms are disseminated by sneezing, coughing, etc. For symptoms and treatment, see Septicaemia.

**Insanity of Pregnancy.** Some women during pregnancy or after delivery are liable to suffer from insanity, especially those who are debilitated and of a neurotic temperament or have a hereditary predisposition to insanity, epilepsy, hysteria, etc. It is called insanity of pregnancy, puerperium or lactation according to the period of onset; the first is the least common and usually disappears after delivery. It may be of an acute maniacal type or melancholic with a tendency to suicide or infanticide. A large proportion of cases recover after delivery or lactation, but it is likely to recur in subsequent pregnancies. Some few cases become permanently insane. The patient requires careful nursing and looking after to prevent her doing harm to herself or the child.

**Abortion.** The expulsion of the foetus before the middle of the seventh month of pregnancy, viz., before it becomes viable or capable of surviving, is called abortion or miscarriage, after that period the term premature labour is used. Sometimes the term abortion is used in the first three months and miscarriage between the end of the third and the middle of the seventh month. It is a common occurrence with many women and there are few women who have borne children who have not had one or more. Many abortions occurring during the first two months of pregnancy pass unrecognized as the size of the foetus is small and the bleeding is slightly more profuse than what occurs during the normal period.

The causes of abortion are numerous and in some cases no appreciable cause can be found. In some women the least exciting cause brings it on, usually some emotional disturbance, shock, unusual physical exertion, slight injury to the abdomen, an operation or some disease, such as diarrhoea, dysentery, severe vomiting, an acute infectious fever, etc. Syphilis is the most important cause of repeated abortions. With some women it becomes a habit without any cause.

The first symptom of abortion is bleeding accompanied with or soon followed by intermittent pain. It is slight at first but soon increases and may be so profuse as to cause alarming symptoms or be fatal if not treated in time. The ovum may be expelled entire or in pieces, in which case some of it might remain in the womb and require early removal. Unless prompt and efficient treatment is given serious com-

plications are likely to occur, such as decomposition of what remains in the womb resulting in septicaemia, chronic inflammation of the womb, etc. Artificially induced abortion, especially by unskilled non-professional persons, is much more dangerous and more often fatal from shock, bleeding, septicaemia or other complication.

The preventive treatment of abortion consists in avoiding as far as possible all the causes which bring it on. The woman should lead a quiet life free from anxiety or emotional excitement, should keep regular hours, avoid violent physical exercise, exposure to cold, strong purgatives, heavy indigestible meals and strong alcoholic drinks, more particularly during menstrual epochs which are times of great danger, as abortions usually occur during them. It is therefore very advisable for the woman to remain in bed or take as much rest as possible and lead a quiet life for four or five days during what would be the menstrual period. Sexual act is not advisable at least for the first four months, especially in the first pregnancy or in case of women who have aborted before.

In case abortion is threatened, as when slight bleeding appears or there are repeated pains, the woman should take to bed immediately and obtain professional help at once. She should refrain from any movement and avoid purgatives, alcohol and heavy meals. It is very important to keep the external genitals clean with soap and warm water and bathed with some antiseptic lotion and use clean or sterilized pads. Vaginal irrigation and large enema should be avoided. For constipation a glycerin suppository or a couple of ounces of olive oil per rectum should be used. In the absence of the doctor an ounce of bromide mixture (No. 65) might be given and repeated once or twice if necessary. If the pain and bleeding stop the danger of abortion has very probably passed, but the patient should remain in bed at least for a week after all symptoms are gone. In case abortion has taken place it is necessary to preserve all that has come out for the inspection of the medical man so as to determine whether the whole of the ovum has come out or some part of it is left behind; in the latter case very early evacuation of the womb is necessary and the sooner it is done the better. No unqualified person should be allowed to touch or meddle with the case as the risk of fatal shock, bleeding or septicaemia is very great.

## CHAPTER XIV

### DISEASES PECULIAR TO WOMEN

**Anatomy of the Female Generative Organs.** On account of the different anatomical structures of the generative organs of the female, women are subject to certain diseases affecting these organs, which are peculiar to them. In order to understand the abnormal conditions of these organs it is necessary to know something about their anatomy. These organs are: (1) The ovaries, which correspond to the testes in the male and which produce the ova or germ cells. Ovaries are two small oval bodies situated, one on each side in the pelvis close to the womb and connected with it by means of membranous ligaments. They contain a large number of minute areas known as Graafian follicles, each containing one ovum or germ cell in the centre surrounded by epithelial cells. These follicles mature singly at an interval of about four weeks after puberty sets in. When mature each measures about  $\frac{1}{125}$ th of an inch in diameter. As it grows it comes to the surface where the covering membrane ruptures and it is discharged on the surface.

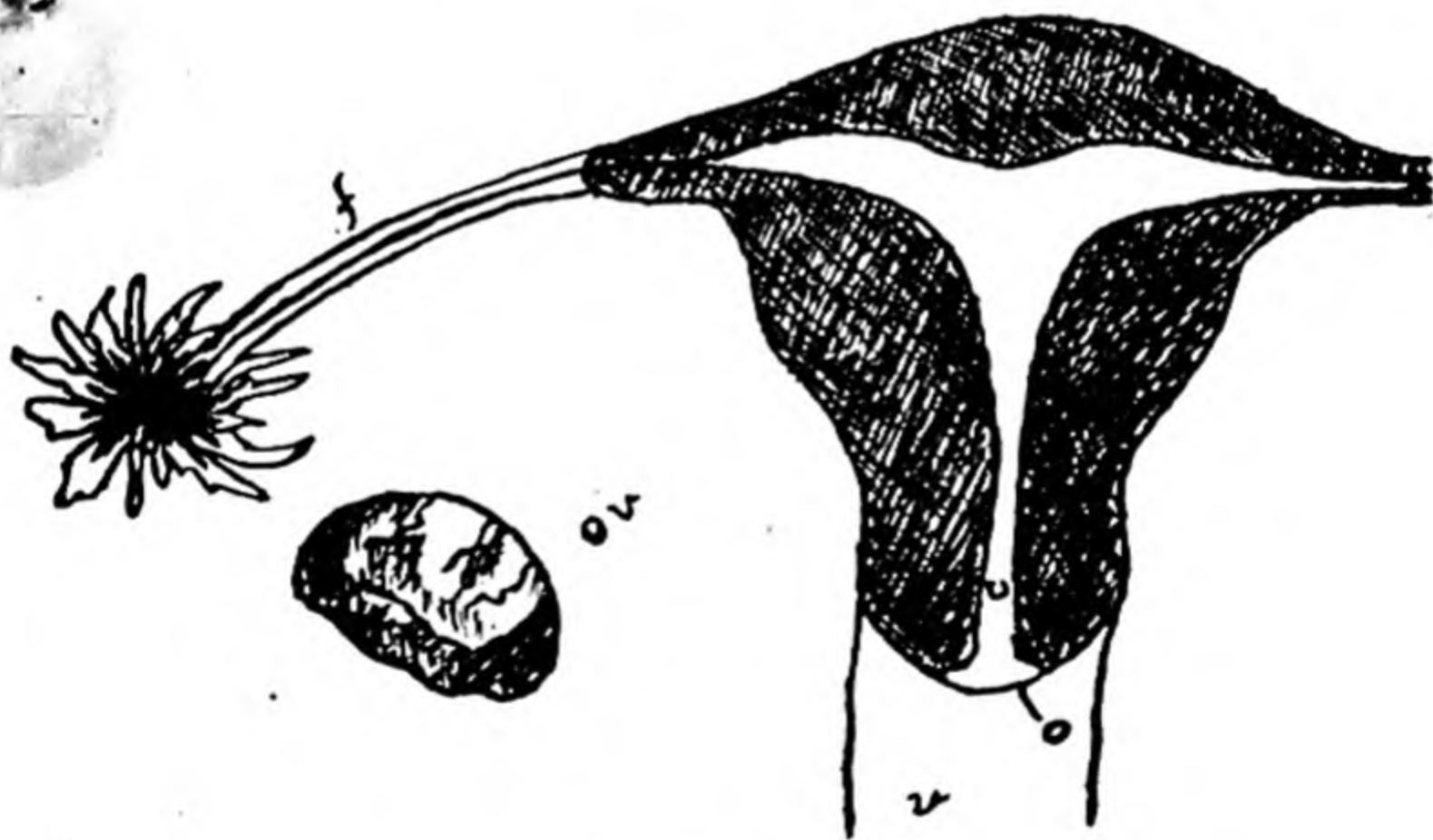


FIG. 1

Vertical section from side to side through the womb. *f*, right fallopian tube; *ov.*, ovary; *v*, vagina; *o*, mouth of the womb; *c*, cervix, i.e., neck of the womb.

(2) Fallopian tubes. These are two narrow tubes, one on each side, the inner end of which opens into the cavity of the womb at its upper angle, while the outer end, which is fimbriated and funnel-shaped, opens into the peritoneal cavity close to the ovary (see Fig. 1). The ovum, after being discharged from the ovary, enters the fimbriated end and travels to the womb through the tube. If fertilized on the way

by a sperm cell or spermatozoon, it attaches itself to the wall of the womb and rapidly grows; but if unfertilized it is disintegrated and passed out by way of the vagina. The spermatozoa, which are very motile, are deposited in the vagina during coitus and travel rapidly upwards, enter the womb and pass into the Fallopian tube where one of them unites with the germ cell.

(3) The uterus or womb. It is a hollow muscular organ more or less triangular in section and consists of the body, cervix, i.e., the neck and the mouth which projects into the upper part of the vaginal cavity (see Fig. 2). The normal unimpregnated uterus is about 3 inches in length, 2 inches in breadth and 1 inch in thickness, the length of the cavity being  $2\frac{1}{2}$  inches. In healthy women between puberty and menopause its inner surface becomes congested and bleeds once every four weeks or so, the amount of bleeding and the interval between each period varying in different women. During the menstrual period the woman should avoid exposure to cold, cold baths, heavy or spicy food, alcoholic drinks and violent exercise. Mild exercise might be indulged in and indeed it is beneficial.

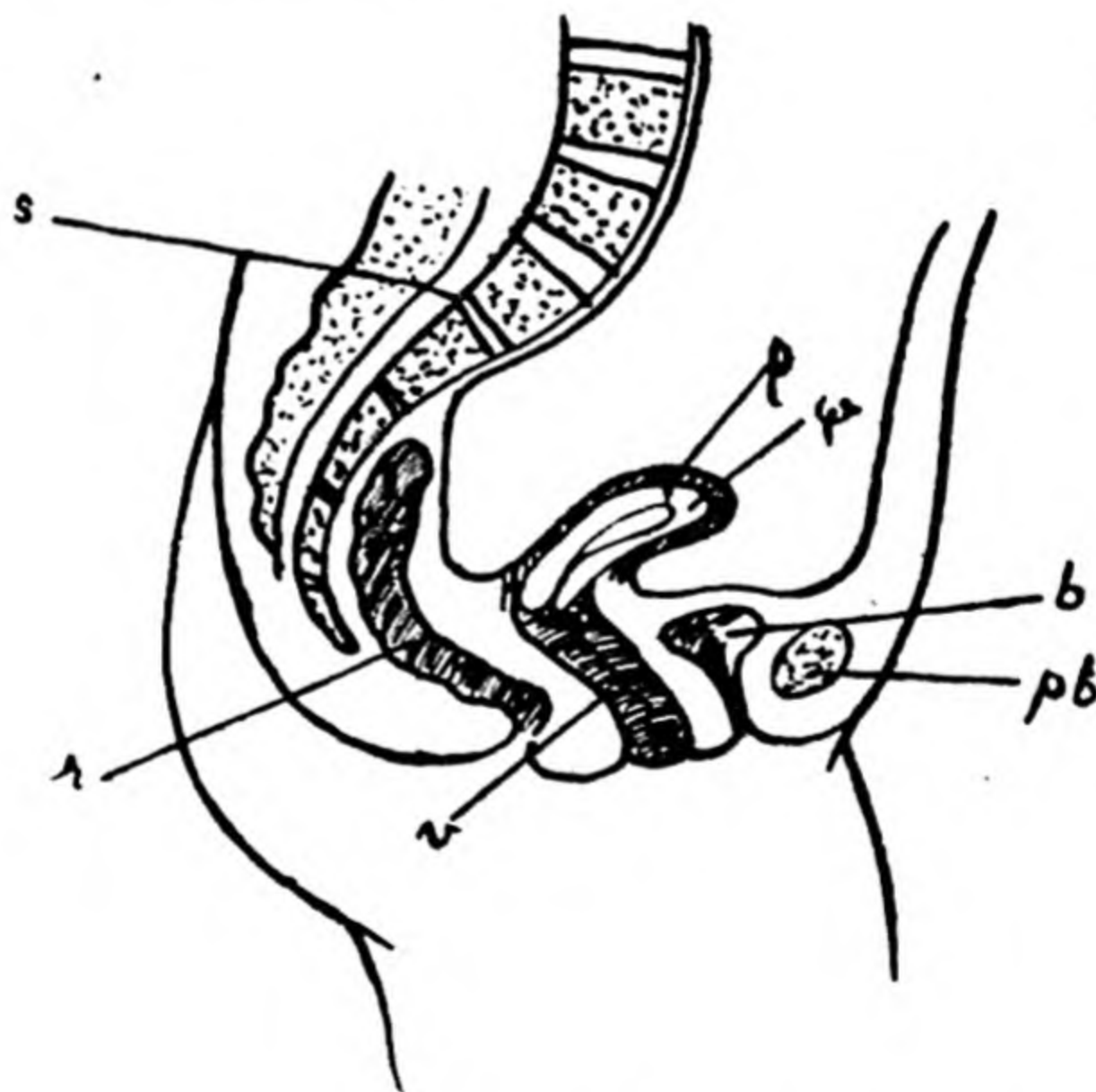


FIG. 2

Vertical section through the female pelvis. *p*, peritoneal lining; *w*, womb; *v*, vagina; *b*, bladder; *r*, rectum; *s*, sacrum; *pb*, pubic bone.

(4) The vagina. It is the lowest part of the genital canal extending into the pelvis in an upward and backward direction and situated between the bladder in front and the rectum behind. It opens below

the opening of the urethra in the vulva, i.e., the external genitals which consist of the labia majora, one on each side, labia minora situated under the labia majora, and the clitoris. The length of the vagina is about two inches along the front wall and about two and three quarters inches along the back. Its upper end surrounds the neck of the womb to which it is firmly attached, while the mouth of the womb and a part of the neck project into it for a short distance (see Fig. 2). In the virgin the outer opening is partly closed by a thin crescentic or circular membrane called hymen with an opening in the centre which allows the menstrual fluid to escape. Sometimes this membrane completely covers the outlet so that the menstrual flow is pent up in the vagina which, in course of time, gets enormously distended and causes much inconvenience and pain. In such cases an incision is necessary in the imperforate hymen to allow the discharge an exit. In every case of absence of menstruation during puberty it is advisable to have the genitals examined.

**Menstruation.** Menstruation is the periodic discharge of blood from the womb lasting for three or four days, usually once every four weeks. It commences at puberty and lasts till menopause. The interval between each period, its duration and the quantity of blood passed vary in different women. In tropical countries its onset is usually between the ages of twelve and fourteen years, while in cold countries it is a little later and may be at fourteen or fifteen. Occasionally it begins early and the child menstruates at the age of nine or so; more usually it is delayed, particularly in badly nourished girls living under bad hygienic conditions. Anaemia, tuberculosis and other chronic diseases delay the onset. The non-appearance of menstruation may be due to diseases of the endocrine glands, particularly of the ovaries, pituitary, thyroid and suprarenal glands whose secretions control the process of ovulation. In healthy girls it may be due to imperforate hymen as described above.

Many healthy women do not suffer any pain or discomfort during the period, but in a large proportion there is a feeling of lassitude, depression, headache and pain in the back or lower part of the abdomen and sometimes a feeling of fullness and discomfort in the breasts. As a rule these symptoms are mild, but in some cases they may be so severe as to require sedatives. These should be avoided as much as possible, particularly some of the synthetic drugs which are positively dangerous and lay the foundation of very serious or fatal diseases. Protection from cold, a simple non-stimulating diet before and during the period and complete rest in bed mitigate the severity of the symptoms, but if sedatives become necessary an occasional dose of bromide mixture (No. 65), not more than once or twice a day might be taken.

**Menopause.** It is the permanent cessation of menstruation towards the end of the reproductive life of the female and occurs usually between the ages of 40 and 45, but in some women and in cold countries it may not occur till 50; it is very rare after that age. In many women it comes suddenly without any unpleasant symptoms, or it may continue irregularly for some months with longer intervals and diminishing flow, or there may be excessive bleeding for some time. Frequent and

irregular bleeding between periods is usually due to some pathological cause requiring early investigation. Some women suffer from some unpleasant symptoms and general ill-health for a short time or for a year or two. The commonest symptom is the vascular disturbance chiefly in the skin producing what is called "hot flushes" lasting for a few minutes or for quarter of an hour. There may be sweating, palpitation, giddiness, fainting and occasional rise of blood pressure. Emotional disturbance is also a common trouble which may appear as hysterical outbursts, depression, excessive sexual desire or aversion to everything sexual. All these symptoms with menopause are known as *climacteric*. Obesity is another unpleasant trouble that occurs during the climacteric which makes some women, who have not borne children, imagine themselves pregnant on account of the increase in the girth round the abdomen and amenorrhoea. Sometimes preparations are made for the expected confinement and clothing and even a cradle kept ready for the baby that never turns up. Digestive disturbances may also occur. The symptoms are rarely so serious as to require special treatment. Light non-stimulating diet, avoidance of alcohol and regulation of the bowels are all that is necessary. The daily routine of work and light exercise should be continued; rest in bed is not necessary unless the general health is bad. For troublesome palpitation an occasional dose of bromide mixture (No. 65) might be taken and discontinued as soon as the trouble subsides. In very bad cases, especially if there is a tendency to obesity, relief is obtained by the oral administration of thyroid extract which should be done under medical supervision, or intra-muscular injections of oestrogen which is a hormonal preparation, twice weekly.

### FUNCTIONAL DISORDERS OF MENSTRUATION

Functional disorders of menstruation are those in which there is no appreciable organic disease or any abnormal change in the organs. These are (1) Amenorrhoea, i.e., suppression of menstruation. (2) Dysmenorrhoea, i.e., painful menstruation. (3) Menorrhagia and Metrorrhagia, i.e., excessive bleeding, the former term being applied to excessive bleeding during menstruation and the latter to bleeding occurring independently of menstrual periods. (4) Vicarious menstruation.

**Amenorrhoea** normally occurs during pregnancy, lactation and after menopause. The non-appearance of menses in an otherwise healthy girl at puberty may be due to imperforate hymen described above. In the course of acute infectious fevers temporary stoppage occurs, one or two periods being missed by the woman. It may result from some disease of the endocrine glands, such as thyroid, pituitary, adrenals or ovaries which control ovulation. In chronic debilitating diseases, such as anaemia, tuberculosis, malignant disease, diabetes, chronic metallic poisoning, etc., it is a common symptom. It may be brought on temporarily by the administration of certain drugs. Temporary cessation may occur after illicit intercourse or in married women expecting pregnancy although no conception has taken place. Total removal of

the womb or ovaries results in permanent stoppage. The treatment is directed towards the removal of the cause after investigation.

**Dysmenorrhoea** is the term applied to painful menstruation when the pain is so severe as to require measures for its relief. We have already seen that some women suffer from a certain amount of pain and discomfort during the period, but it does not require any special treatment. All cases of severe pain require a careful investigation to determine the cause, as the trouble is likely to continue until this is removed. It is not at all advisable to take sedatives frequently, especially the synthetic drugs which are positively dangerous and may produce some serious and fatal disease of the blood, moreover they do not remove the cause and require larger doses to produce the same effect after a time.

**Menorrhagia** is the term applied to excessive bleeding during menstruation, while metrorrhagia is used for bleeding which occurs irrespective of menstruation. Both kinds are often met with at menopause. Bleeding occurring at irregular intervals requires very early investigation as it may be due to malignant disease of the womb. Endocrine disturbances common during menopause are usually responsible for menstrual or inter-menstrual bleeding, but this is of short duration and disappears without any treatment or, if troublesome, it can be controlled by injections of hormones.

Vicarious menstruation is an uncommon occurrence in which periodic bleeding takes place during the normal menstrual period from the nose, lungs, stomach, etc. This may occur in women whose womb or ovaries have been removed on account of some disease or do not function for some reason or other. As a rule the bleeding is slight, of short duration and does not require any treatment.

**Extra-uterine Gestation.** The term is applied to an abnormal condition in which gestation takes place outside the cavity of the womb. We have already seen that the ovum, after it is discharged from the Graafian follicle in the ovary, passes along the Fallopian tube to the womb where it attaches itself if fertilized by a sperm cell on the way. But sometimes after fertilization its progress is arrested and it does not reach the womb but is embedded in the wall of the Fallopian tube, very rarely in the ovary, and begins to grow in this abnormal position. The cause of the arrest of its progress may be an obstruction in the lumen of the tube either from a chronic inflammatory condition or a kink. In this situation it does not grow to full term but the sac, on account of its thin wall, ruptures into the peritoneal cavity, usually about the third month, sometimes later. The woman is usually not aware that she is pregnant as the menstrual bleeding may continue for one or two periods.

The rupture of the sac is accompanied with sudden severe pain in the abdomen, pallor of the face, difficulty of breathing, cold sweat and collapse from bleeding which may be so severe as to be fatal. Immediate surgical operation is necessary to secure the bleeding vessels and remove the sac with its contents.

**Sterility.** The causes of sterility are numerous, they may be temporary or permanent and may be present in the wife or the husband or both.

They may be local when situated in the organs of generation, or general when due to some other condition. The local causes are inflammation of the internal organs, mostly gonorrhoeal in origin, congenital malformation or absence of the womb or its displacement, removal of the womb or the ovaries for disease, occlusion of the canal leading into the cavity of the womb, presence of tumour and exposure of the ovaries to X-rays or radium. An imperforate hymen or a tough hymen with a narrow opening may also cause sterility on account of the mechanical obstruction. Fertility in a woman diminishes after the age of 30 and stops at menopause. Very obese women are generally sterile. Prolonged use of contraceptives is likely to produce permanent sterility.

Of the general causes syphilis is very common; it causes frequent abortions or still-birth. Any disease or condition that lowers the vitality of the body reduces the chances of pregnancy. A sexually frigid woman conceives less readily than one whose sexual desires are strongly developed. A woman in vigorous health and one who leads a healthy outdoor life is more fertile than one who leads a sedentary indoor life. The deficiency or absence of certain vitamins in the diet, especially vitamins "E" and "K", produces sterility or frequent abortions; similarly the deficiency of vitamins "A", "B" and "C" by causing general ill health favour sterility. The deficiency of endocrine secretions which control ovulation is also responsible for sterility. In many cases after careful investigation no cause can be found either in the wife or the husband and there are cases on record in which a sterile pair that had lived a normal sexual life for years have become fertile with other partners after separation.

**Dyspareunia.** The term is applied to sexual intercourse which is difficult or is accompanied with severe pain. As a rule there is some pain during the first coitus which varies in severity in different women, but it is not so severe, is not repeated subsequently and does not require any treatment. In dyspareunia it is severe, is felt every time and may be of such a nature as to prevent sexual intercourse altogether. The condition may be present without any lesion of the organs or it may be due to some disease or abnormality. In the former case it is known as primary and may be present from the beginning, generally in very nervous women who have unreasonable fear of pain which brings on a spasm of muscles as soon as an attempt is made. The latter condition may occur in women who have previously experienced sexual intercourse without any trouble. Such cases are due to some lesion, such as an inflammatory condition, mostly in young, and malignant disease in elderly women. All these cases require a thorough examination and investigation before any treatment can be undertaken. The primary condition in a virgin due to fear without any appreciable lesion does not require any special treatment except tact and patience on the part of the husband, failing that the gradual dilatation of the vaginal orifice with graduated glass dilators under medical advice and supervision may dispel the fear of pain. For imperforate hymen or hymen with a narrow opening a surgical operation is necessary.

## DISPLACEMENTS OF THE WOMB

The womb is situated in the pelvis between the bladder in front and the rectum behind, supported on the pelvic floor which is composed of muscular and fibrous structures and held in position by ligaments. It is slightly bent forward forming an angle with its neck, while its long vertical axis is slightly inclined forward (see Fig. 2). It is subject to displacement in the forward or backward direction; when its vertical axis is tilted in front more than usual it is known as anteverted and when it is inclined backward it is called retroverted, the displacements being known as anteversion and retroversion respectively. The normal flexion, i.e., the angle between the body and the neck is liable to be altered; when the womb bends on itself more than normal the displacement is called anteflexion, but when the angle is opened out or in extreme cases the body is bent backward it is known as retroflexion. Another displacement, which sometimes takes place and which has been referred to under surgical diseases (*q.v.*), is prolapse in which the womb as a whole is displaced downwards and projects into the vagina. This happens in debilitated elderly women whose pelvic floor has been damaged during labour. The extent of displacement varies, the womb may project a little into the vagina still remaining in the pelvis, or it may project through the vulva turning the vagina inside out. In such cases the vaginal mucous membrane becomes dry and hard like the skin.

Flexions and versions, when slight and not of long duration, can be easily rectified by means of the uterine sound and no further treatment may be necessary, but in bad and chronic cases the use of a pessary to hold the womb in place until it settles down in its place becomes necessary. A slight prolapse may be remedied by the use of a special pessary but in bad cases surgical interference is necessary to fix the womb in its place and repair the perineum.

**Inflammation of the Womb.** The inflammation may be confined to the lining membrane when it is called endometritis, but it may extend through the whole substance when it is known as metritis. Both varieties may be acute or chronic. Acute endometritis results from infection carried from outside, mostly gonorrhoeal, or it may be caused by other infection after abortion or labour. The symptoms are pain in the lower part of the abdomen and back, some fever, general disturbance of health depending upon the severity of infection and discharge from the womb. The trouble, if not properly treated or if neglected, becomes chronic. Tubercular disease is likely to affect the lining membrane, being secondary to a tubercular focus in some other part of the body.

Metritis is always due to injury and infection caused during induced abortion or labour. It is a serious condition and may cause general septicaemia. In acute cases there is much pain and discomfort in the pelvis and excessive bleeding which is confined to menstrual periods, but these become longer and longer so that the intermenstrual period becomes shorter and shorter and may be a few days only. As a result of the bleeding anaemia supervenes and the general health is much run down and the woman may become neurotic or hypochondriacal. In

the acute stage, besides professional treatment, rest in bed, nourishing diet, relief of constipation and hot fomentations locally are indicated.

**Cervical Erosion.** By this term is meant an erosion resembling an ulcer on the mouth of the womb or inside the lower part of the neck due to a chronic inflammatory process. The condition is more common in women who have borne children, but is occasionally found in virgins also. The symptoms are general ill health, pain or a sense of discomfort in the pelvis, especially during menstruation and a discharge of mucus mixed with pus. The condition becomes chronic and troublesome unless properly treated in time. It requires cauterization and free drainage, professional help should, therefore, be obtained as early as possible.

**Tumours of the Womb.** Malignant and non-malignant tumours may grow in any part of the womb or the neck. They are more common after the age of thirty and their incidence increases till fifty or fifty-five. They vary in size and composition. The non-malignant variety may consist of fibrous, muscular or mixed elements and often grow to an enormous size. They do not always prevent pregnancy but are likely to be troublesome and may cause serious obstruction to labour on account of their size and situation. The most common symptom is prolonged menstrual bleeding so that in course of time the free interval is a few days only. If the tumour projects on the surface only there may be no bleeding. Pain is not severe and is not always present. A thin mucous discharge may be present just before menstruation. A large tumour may press on the bladder, rectum, blood vessels and nerves and produce pressure symptoms, such as frequency or retention of urine, straining and discomfort at the time of defecation, swelling of the legs and pain in the pelvis and lower limbs. Small tumours on the surface cause no trouble and are discovered in the course of an examination for some other trouble. The best treatment for them is to have them removed as soon as their presence is detected. It may be necessary to remove the whole womb if the tumour is large. In case the operation is contraindicated for some reason exposure to X-rays or radium is found to be beneficial.

Malignant tumours may be either sarcoma growing from the connective tissue or carcinoma, i.e., cancer proper growing from the epithelial cells lining the womb. The former variety is less common and is met with in young women, while the latter is much more frequent and is found in elderly women. It may arise in the body or the neck and spreads rapidly. The early symptoms are the same as those of non-malignant tumours but they rapidly increase in severity with bleeding and pain which is a very prominent symptom and is usually very severe. The patient rapidly loses weight and becomes exhausted from pain, want of sleep and bleeding. Very early recognition and the removal of the whole womb with the growth and exposure of X-rays or radium afford the only chance of a cure.

**Inflammation of the Ovary.** It is called ovaritis or technically oophoritis. It may be acute or chronic and is due to an infection spreading from any of the adjacent parts. The symptoms of the original condition are present and in acute cases pain is felt down

the thigh and in the pelvis which is worse before and during menstruation and the bleeding is in excess during the period. If suppuration takes place the pain becomes severe and there is fever with much disturbance of general health. The treatment is to be directed to the primary condition. During the acute stage rest in bed, mild purgatives and hot fomentations are useful in relieving pain and reducing inflammation. If suppuration takes place early surgical interference becomes necessary.

**Tumours of the Ovary.** The ovaries are liable to be affected with malignant and non-malignant tumours, the cystic variety being fairly common which grows to a very large size. Another peculiar tumour sometimes found in the ovary, though not always confined to that organ but found in other parts of the body and in the male also, is known as *teratoma*. It is derived congenitally and may be malignant or non-malignant and contains fully or partly developed parts of the body, such as teeth, hair, pieces of bone, etc., enclosed in the tumour. The treatment of all ovarian tumours is very early removal.

**Inflammation of the Fallopian Tubes.** It is technically known as salpingitis which may be acute or chronic and is caused by infection spreading from the womb. Gonorrhoeal infection is a very common cause of acute inflammation which if not treated properly may end in suppuration. There is severe pain in the abdomen which may come on suddenly and is worse during and after menstruation. The menstrual bleeding is in excess and lasts longer than usual. The pain becomes severe and constant when suppuration takes place and fever and general disturbance of health are also present. Rest in bed, abundant fluids to drink, mild aperients, hot fomentations and sedatives for the relief of pain are required by way of treatment. If suppuration has taken place, or if severe pain is felt constantly in chronic cases surgical interference becomes necessary.

**Vaginitis.** By vaginitis is meant an inflammatory condition of the mucous membrane of the vagina. Gonorrhoeal infection is a very common cause when the condition is severe and is apt to spread to deeper parts and become chronic. Non-gonorrhoeal inflammation may be due to injury, introduction of foreign bodies, uncleanness, a neglected pessary which has been allowed to remain too long, douching with strong antiseptic lotions or strong chemical contraceptives used frequently. The treatment is to remove the cause, keep the external genitals clean and use a mild antiseptic douche. The gonorrhoeal variety is readily amenable to specific treatment with sulpha drugs if taken in hand early.

**Leucorrhoea.** The term is used for a discharge from the vagina; it is also known as *whites*. It is whitish in colour resembling the white of an egg, but may be yellow or greenish yellow if there is pus in it. Normally there is a very small amount of mucous secretion from the womb and a little watery fluid secreted in the vaginal mucous membrane which is just enough to keep the parts moist. This secretion increases during sexual stimulation. In health there are no micro-organisms in the vagina but they might be introduced during

abortion, badly managed labour or through foreign bodies introduced into the vagina, uncleanliness, a tumour in the womb, and in debilitated health. In gonorrhoeal infection there is a good deal of irritating purulent discharge and in malignant disease it is purulent and offensive. In elderly women an excessive discharge is sometimes due to endocrine disturbances which are common at this time of life.

Personal cleanliness is very important in the treatment of leucorrhoea. The cause, if possible, should be removed and steps taken to improve the general health. When pus is present the administration of sulpha drugs or penicillin is useful. Strong and frequent douche should be avoided as very often the discharge continues or increases on account of the irritation caused by the strong antiseptics used.

## CHAPTER XV

### PRESERVATION OF HEALTH

No one is so miserable in this world as the man with chronic ill health, and one does not realize the blessings of good health until it is irretrievably lost. The study of diseases and their causes has revealed the fact that about 90% of all the human illnesses are avoidable and are brought on by the violation of simple rules of health through ignorance or carelessness. It is much easier and cheaper to preserve one's health by observing these than to regain it after having wantonly thrown it away. The human body is a very delicate machine and requires for its efficient working as much care and attention as any other machine. Barring accidents, it is possible by observing a few simple rules to exceed substantially the span of "three score years and ten" and enjoy life till the end.

These rules are considered under the following heads:—

- (1) Food.
- (2) Exercise.
- (3) Air.
- (4) Rest and Sleep.
- (5) Cleanliness.
- (6) Clothing.
- (7) Oral Hygiene.
- (8) Tobacco and Smoking.
- (9) Excretion of the Waste Products.
- (10) Exposure to Communicable Diseases.

(1) **Food.** The food of modern civilized man has become very complicated, less easily digestible, and does not contain many elements essential for the maintenance of health, while it contains many substances which are harmful. All preserved food, particularly meat, fish and vegetables, is not so wholesome as when fresh and does not contain vitamins. Plain food with very little spices is the best. It should be well balanced, i.e., it should contain all the necessary elements, such as protein, fat, carbohydrates, salt, vitamins and fresh vegetables. After the age of 40, when the need is not so great, the intake should be so adjusted as to keep the body weight at a constant level. The need for protein and fat is not so much in advanced age, and they should be limited. If the intake exceeds the actual requirements the excess accumulates in the body as fat, clogs the system, and throws heavy work on the heart and excretory organs, causing ill health and disease and shortens life. One very wise rule to follow, as all animals do, is not to touch food if there is no inclination for it. An old Arab adage, with regard to the preservation of health, is "withdraw your hand from food before the appetite is fully satisfied." The stomach is a delicate organ and requires careful treatment if it is to perform its function efficiently. Chronic dyspepsia, indigestion, inflammation and ulcer of the stomach, sluggish or inflamed liver, congested

kidneys, palpitation, insomnia and many other obstinate troubles result from frequent overloading of the stomach. The habitual use of rich food, containing excess of carbohydrates and fats and wine, produces obesity, high blood pressure, diabetes, gout and other preventible diseases.

Children and some grown up persons sometimes take a dislike to some particular item of food without any apparent reason; in such cases it is very important to find out if the dislike is due to allergy and if so, that item should be avoided. Apart from this any kind of faddishness with regard to food is meaningless and harmful and should not be indulged in.

As regards alcohol, there is not the least doubt that its habitual and excessive use is positively harmful, and is the cause of many preventible and dangerous diseases; it not only shortens life but makes the end very miserable. Taken in small quantities and well diluted at meal times, it produces a sense of appetite by its stimulating effect on the mucous membrane of the stomach and increases the secretion of the gastric juice, but contrary to popular belief it has no beneficial effect on the digestive function. It is very advisable not to take it as an appetiser and load the stomach with food when the nature's signal indicating the necessity for it is absent. The habitual use of alcohol diminishes its stimulating effect so that the quantity has to be increased so as to produce the same effect in course of time, while its deleterious effects increase in proportion to the quantity taken. The only beneficial effect produced by alcohol, apart from its use in medicine, is when a small diluted dose is taken after a day's hard physical and mental work when the body and mind are tired, especially in persons past middle life, as it brightens the mind, relieves the sense of fatigue and induces sound sleep which are conducive to good health. Apart from this, its use as a stimulant, or an appetiser does not benefit the mind or body.

(2) **Exercise.** For the maintenance of health and strength regular exercise is just as essential as food. It is a physiological fact that if a muscle or an organ is not given regular and adequate work it becomes thin, weak and wastes, but with regular work it increases in size and strength. Exercise stimulates circulation which brings more nourishment and more oxygen to the muscles and organs, and it stimulates the skin and enables it to get rid of some of the waste products from the body through the sweat. Moderate exercise produces a pleasant sense of fatigue, increases appetite, helps digestion, stimulates the function of the liver, bowels and kidneys, and induces sound refreshing sleep. All these tend to promote health and build up a strong body with increased powers of resistance against disease. It is immaterial what particular exercise is taken as long as some few simple rules are observed. It should preferably be in the open air, or if indoors, it should be in a well ventilated room. It should not be overdone as is the tendency among young people, as over-exercise is more harmful than no exercise, and its harmful effects may not be noticeable immediately but are very likely to do some permanent harm to the body, particularly the heart. Heavy weight-lifting, long distance running,

cycle racing and all such exercises are apt to be overdone. They require expert and careful supervision and are not suitable for ordinary requirements and should be avoided. Exercise should not be taken after a heavy meal or on an empty stomach; heavy draughts of cold water should be avoided before or soon after exercise. A cold bath, immediately after exercise when the body is warm, is harmful, but there is no objection to it when the body has cooled and if it can be borne without discomfort.

Exercise uses up the carbohydrate fuel in the body which should be replaced sufficiently. Sugar or some other carbohydrate food taken before severe exercise has a sustaining effect during exertion; exhaustion comes sooner if the quantity of sugar in the system is deficient and is completely used up during exercise. Immediate effects of over-exercise are depression, a feeling of restlessness, sleeplessness, or disturbed sleep, loss of appetite and aches and pains in the limbs; all these may not be present at the same time. After the age of 40 all violent games and severe exercise should be avoided. Walking is the best exercise for persons of advanced age.

(3) **Fresh Air.** The importance of fresh air for the maintenance of health cannot be over-emphasized. The air we breathe is mainly a mixture of oxygen, nitrogen and carbon dioxide gas, besides other substances in minute proportions and many impurities, such as dust, particles of coal, organic matter, etc., whose proportion is high in the atmosphere of cities. Oxygen is the most important element, as without it life would be impossible. Nitrogen is an inert gas and serves the purpose of diluting oxygen. Carbon dioxide is produced in the body as a result of metabolism, and is carried to the lungs in the venous blood where it is exchanged for oxygen, and is expelled in the air exhaled, which, therefore, contains a much larger proportion of it and less of oxygen. The expired air also contains a much larger proportion of moisture, some organic matter, and very often disease germs, particularly the air of crowded and badly ventilated rooms. All these rapidly diffuse in the open air where the proportion of oxygen remains constant; but in close ill-ventilated rooms the impurities accumulate and are harmful if inhaled frequently. It is therefore very important to have all bedrooms and living rooms thoroughly ventilated to prevent the accumulation of these harmful elements. Chronic ill-health, diseases of the respiratory organs, tuberculosis and many chronic and dangerous diseases are common among people who live and sleep in badly ventilated rooms.

Any obstruction to free nasal breathing, such as adenoids, nasal polypus, enlarged tonsils, etc., particularly in children, should be attended to as early as possible, and before they do any permanent harm. It is advisable to teach children from an early age to acquire the habit of deep breathing as it expands all parts of the chest, allows more oxygen to be taken in and increases the capacity of the lungs.

(4) **Rest and Sleep.** During physical or mental exertion, not only the reserve supply of the fuel in the body is used up, but there is an excessive accumulation of waste products-which cause fatigue; suffi-

cient rest and sleep are, therefore, necessary so as to allow the system to recoup and get rid of the waste products. Ordinarily, a healthy adult after an average day's work requires seven to eight hours' sleep, while those undergoing much physical or mental work require more. Old persons, as a rule, sleep less and growing children require at least ten hours, while infants sleep through most of the day. It is advisable, especially in the tropics, to rest for half an hour or so after the midday meal. Those who cannot leave their work should relax their mind and muscles while resting in an easy chair at least for half an hour, and take a few deep breaths which will refresh the mind and body. Habitual late hours and want of proper sleep at night weaken the mind and have a deleterious effect on health. In order to have sound, refreshing and dreamless sleep avoid alcohol and a heavy meal before bedtime and relax all muscles of the body as soon as you are in bed, banish all thoughts of work and worry and keep the eyes lightly shut. The habit of complete relaxation and forgetfulness can be cultivated with a little practice, though it seems impossible in the beginning.

(5) **Cleanliness and Personal Hygiene.** Not only many diseases of the skin are caused for want of cleanliness, but the general health is also adversely affected, and many dangerous and infectious diseases are produced by it. Many disease-carrying insects, such as lice, fleas, bed-bugs, etc., thrive on unclean persons. There are innumerable minute pores in the skin through which the sweat glands discharge their secretion, which keeps the skin moist and soft and regulates the body temperature. Even when the body is apparently dry a good deal of imperceptible sweat flows more or less continuously through these pores, except when the atmospheric temperature is below that of the body. It has been found that if all the pores in the skin are occluded with some paint or varnish the heat regulating mechanism is upset and death takes place within a short time. These pores get constantly choked with dust and dirt and require washing with soap and water so as to keep them patent. The bar soap, which is quite inexpensive, has much better cleaning properties than most of the finely scented and coloured soaps which are often actually harmful to the skin. Sandal oil, which is much used in soaps, is very irritating to the skin and in some persons causes chronic eczema. Some few persons with very delicate skin are unable to use any kind of soap; they should use gram flour in place of soap as it is non-irritating and has very good cleaning properties.

(6) **Clothing.** In tropical countries light cotton or linen material is best for ordinary wear, except in cold weather. All clothes should fit comfortably without causing any obstruction to breathing or full expansion of the chest. The body should be protected against draughts or sudden chilling, particularly when it is moist and warm after exercise or when fatigued; a woollen jacket or pullover should be used when immediate change of clothing is not possible. This is necessary even in hot weather and evenings when there is a sudden drop of temperature of several degrees. Wet clothes should not be allowed to

remain on the body for any length of time on account of the chilling effect. Before changing, the body should be vigorously rubbed with a dry towel so as to stimulate the circulation in the skin. Habitual cold extremities are due to feeble circulation which should receive proper attention. Such persons are apt to catch cold on the slightest excuse and require greater protection. Children and old persons are very susceptible to sudden changes in the atmospheric temperature. In tropical countries just before the beginning of the cold or hot weather the first part of the night is warm when the heat is radiated from the ground, but soon after midnight it becomes chilly, so that persons sleeping in the open, or without proper protection are apt to catch cold. Under such circumstances some kind of light covering should be kept handy in bed so as to cover the body as soon as the temperature drops towards the morning. In mosquito infested localities shorts, and shirts with short sleeves should not be worn after sunset as a precaution against malaria and other mosquito borne diseases.

(7) **Oral Hygiene.** Bad teeth are responsible for many serious and avoidable diseases, such as pyorrhoea, chronic indigestion, intestinal troubles, gastric ulcer, appendicitis, chronic arthritis, etc. All these could be avoided if a little care and a few minutes are bestowed on them after each meal. The particles of food that lodge in the crevices between the teeth, and also between the cheek and gums decompose rapidly on account of the very favourable conditions present in the mouth, viz., heat, moisture and bacteria. As a result of decomposition acid is produced which corrodes the enamel exposing the underlying sensitive dentine. The bacteria invade the roots and form small pockets of pus around them, the condition being known as *pyorrhoea alveolaris*. From here the pus gets constantly absorbed into the system and is the cause of many chronic and troublesome diseases; chronic arthritis with stiff and deformed joints is one of the results. Early decay of teeth is often due to want of vitamins A and D in the diet.

After each meal the mouth should be well rinsed out with clean water or some mild antiseptic solution and the teeth brushed with a soft brush; a hard brush has no advantage over a soft one and is apt to damage the gums and cause their recession and bring on pyorrhoea. The basis of most of the tooth powders and pastes is chalk with alkaline salts of sodium and magnesium; these can be used without any harm. The use of toothpicks should be avoided, but if one has to be used it should be of quill or wood as metal ones are likely to damage the enamel. It is very advisable to have the teeth examined by a dentist once or twice a year so as to remedy any defect that might be present before much harm is done.

(8) **Tobacco and Smoking.** Tobacco contains a liquid alkaloid called nicotine which is a potent poison, and one or two drops of it are sufficient to cause the death of an adult. When absorbed in minute quantities it is not readily excreted, but accumulates in the body, and produces slow poisoning, being particularly harmful to the heart and eyes. Its harmful effects are not ordinarily noticeable, but during extra physical exertion it produces palpitation, rapid pulse, breathlessness and

pain in the heart. When the quantity of nicotine absorbed is large it produces what is known as *tobacco heart*. The pulse rate at rest increases to 90 or 100 per minute and the slightest exertion causes breathlessness, palpitation and inability to undergo any sustained physical effort. The symptoms of acute tobacco poisoning, such as vomiting, nausea, giddiness and faintness are experienced by everyone when trying to smoke or chew tobacco for the first time. A certain amount of tolerance is established by frequent use but the deleterious effects are none the less noticeable. The constant irritation of the throat and larynx from tobacco smoke is apt to cause chronic inflammation, or even cancer of these parts. Cancer of the larynx is much more common among smokers than non-smokers, the proportion being more than ten to one. Tobacco chewing is responsible for the cancer of the tongue and cheeks. On account of its harmful effect on the heart, athletes in training are not allowed the use of tobacco in any form. Tobacco addicts often extol the soothing effect of smoking on nerves, but the fact is, that the habitual use of tobacco produces a depressed state of nerves which needs soothing. It is a habit-forming drug and like all such drugs the craving becomes irresistible, and the mental faculties are depressed unless the craving is satisfied. The constant presence of nicotine in the blood causes thickening and hardening of the arteries and predisposes the person to apoplexy and has a weakening effect on the mind. Excessive smoking damages the delicate tissues of the eye, and may produce what is known as *tobacco blindness*. Nicotine is excreted through the lungs, kidneys and skin and produces its irritating effect on these organs. The skin of heavy smokers, especially that of the face, acquires roughness and an unhealthy colour.

Occasionally, an advertisement or a disinterested looking item of news appears in newspapers supposed to be the opinion of some medical authority as to the harmlessness of smoking tobacco, or its beneficial effect on the body. This is nothing but a subtle propaganda emanating from firms interested in the sale of tobacco.

(9) **Excretion of the Waste Products.** The waste products of the chemical changes, which constantly take place in the body, accumulate in the blood, and unless promptly removed by the kidneys, bowels, lungs and skin damage the tissues and organs and cause ill health. It is therefore very important to encourage the excretory functions of these organs, and avoid any additional load on them by overeating, immoderate use of alcohol, irregular habits, exposure to chill and want of exercise and fresh air. The action of the bowels should be kept regular by proper food, exercise, etc. (see Constipation, Part I). For the proper performance of the function of the kidneys, skin and lungs, a sufficient intake of fluids is necessary so as to dissolve and dilute the waste products, and enable the organs to remove them from the blood. Many persons through some mistaken belief or some meaningless fad, limit the intake of water thereby laying the foundation of some serious trouble.

(10) **Exposure to Communicable Diseases.** In tropical countries the risk from communicable diseases is much greater on account of the

backward condition of sanitation and consequent prevalence of communicable diseases. The preventive measures against these have been described under their respective headings. Personal hygiene, avoidance of exposure to infection, maintaining the resistance of the body, and taking advantage of preventive inoculation when available are the effective measures to reduce the risk. It is not always possible to keep away from infection, but for many diseases protective inoculation is available. Typhoid, plague, cholera, tetanus and other diseases can be guarded against by timely inoculation, the efficacy of which has now been proved definitely. The slight discomfort caused by the inoculation for 24 or 36 hours is nothing compared to the serious risk to life. In spite of the spurious and plausible arguments advanced by anti-vaccinationists and anti-inoculationists the reliable statistics collected in the army speak for themselves. Before the introduction of protective inoculation typhoid, cholera, tetanus, etc., used to take a very heavy toll of the armies in the field but in the last war these diseases were practically abolished, though the men were exposed to the infection not less than in the previous wars. The inoculation against infectious diseases is developed after prolonged study and observation by men of science and the uninformed propagandists, who know nothing of the subject, are the least qualified to pronounce an opinion on such a technical subject.

## CHAPTER XVI

### CARE OF THE EYE

The eye is a very delicate and complicated organ and requires great care and looking after for its preservation and efficient functioning. It is situated in the bony cavity of the orbit surrounded by a cushion of fat where it is protected from injury. The eyelids in front prevent dust and foreign particles from entering the eyes and keep the surface of the cornea clean and moist. In construction the eye resembles a camera with its different parts, viz., the lens, iris diaphragm, focussing arrangement, a screen on which the image is focussed and a sensitive medium on which the image is produced. The arrangement for focussing in the eye differs from that in the camera; in the latter the lens, which has a constant power of refraction, is moved forward or backward so as to bring the focus on the screen, while in the former the lens, which is elastic, is fixed in its place but its convexity can be increased or decreased, thus increasing or decreasing its refracting power, according to requirements, by means of fine muscular fibres attached to its periphery so as to bring the focus on the retina which is the sensitive medium. This focussing arrangement in the eye is known as accommodation.

The eyeball is more or less globular in shape consisting of two unequal segments (see Fig. 3), the smaller one in front is transparent and projects a little in front and is known as cornea. The segment behind is much larger, is opaque and made up of tough fibrous tissue which maintains the globular shape of the eyeball and is called the sclerotic coat. To its outer surface thin muscles are attached which move the eyeball in all directions so as to allow an extensive field of vision.

The lens is an elastic transparent body enclosed in a capsule, to the periphery of which very thin muscular fibres are attached, which by their action increase or diminish its convexity thus increasing or diminishing its refracting power. In front of the lens there is a thin dark diaphragm known as the iris with a circular opening in the centre which is the pupil. The free margin of the iris is surrounded by very fine muscular fibres which by contracting or relaxing diminish or increase the aperture so as to regulate the entrance of light into the eye. The space between the lens and the cornea is filled with a thin transparent watery fluid called the aqueous humour, while the space behind the lens, which is shut off from the front chamber, is filled with a transparent viscid fluid known as the vitreous humour.

The inner surface of the sclerotic coat is lined with a delicate membrane known as the retina on which the external objects are focussed. It is made up of very sensitive nerve cells connected with nerve fibres that convey the impression of the image through a large nerve known as the optic nerve to the brain where it becomes visible. This can be proved by the fact that if the transmission line to the brain is interrupted anywhere along its course, or the receiving station in the brain is damaged blindness would result even if the eyeball

is normal. Blindness would also result if the entrance of light is obstructed anywhere in its course from the cornea to the retina. This may be due to opacity of the cornea caused by a scar of an injury or ulceration, opacity of the lens on account of cataract formation, or of the vitreous humour from disease, bleeding, etc. (Disease or detachment of the delicate retinal membrane also causes blindness.)

An eye in which parallel rays from an object about 20 feet from it are brought to a focus on the retina without an effort of accommodation is said to have normal power of refraction and is called an emmetropic eye. But when these rays are not focussed on the retina the eye is said to be ametropic, i.e., having abnormal refraction.

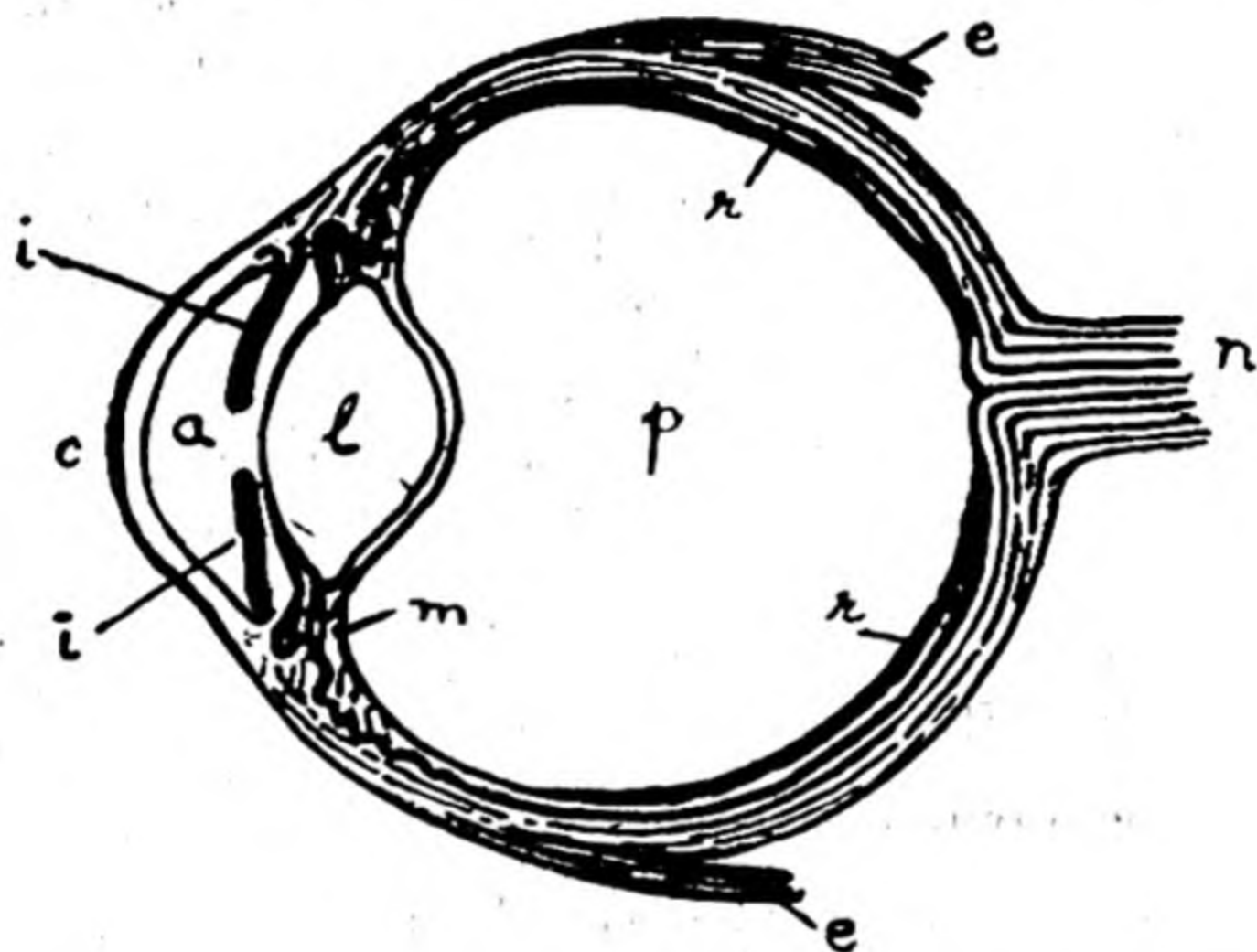


FIG. 3.

Vertical section through the eyeball showing *c*, cornea, *a*, anterior chamber, *ii*, iris, the gap between the ends is the pupil; *l*, lens; *m*, muscular fibres which alter the refracting power of the lens; *p*, posterior chamber containing a transparent viscid fluid called the vitreous humour; *rr*, retina; *n*, optic nerve; and *ee*, ends of external muscles attached to the eyeball.

Ametropia is of three different varieties. (1) Hypermetropia, i.e., far-sightedness, when the focus of parallel rays coming from a distance of 20 feet lies behind the retina on account of defective refracting power of the lens. (2) Myopia, i.e., short-sightedness, in which on account of abnormally high refracting power of the lens the focus lies in front of the retina. (3) Astigmatism, in which the refracting power of different diameters varies on account of defective curvature of the cornea in one or more directions so that all the rays entering the eye are not focussed at one point, those coming from the greater curvature are focussed in front of those coming from the lesser cur-

vature producing a blurred image.

Another defect, in which the power of accommodation is diminished from loss of elasticity of the lens due to age, is called presbyopia which commences at the age of forty and increases progressively until it reaches its maximum. It affects the near vision at first and the person has to hold the book further and further away until in course of time the distance becomes so great that he is unable to see the types without the aid of glasses. The defect is corrected with plus glasses which supplement the diminished normal power of refraction of the lens. In the hypermetropic eye presbyopia sets in earlier and for correcting the vision stronger plus glasses have to be used, while in myopia the power of the plus glasses, with which the vision has been corrected, has to be reduced periodically or the glasses dispensed with when presbyopia sets in.

In squint one or more of the muscles attached to the eyeball to move it in different directions is weakened or paralysed so that the eyeball is pulled to the opposite side by the unopposed action of the muscle on the healthy side and the eyeball cannot be turned to the affected side. The defect is congenital or may be acquired. It may be corrected by proper exercise if the treatment is undertaken early or in late cases by a surgical operation to divide partly or wholly the contracted muscle on the opposite side. On account of the deviation of the affected eyeball the axes of both the eyes do not correspond, the result being diplopia, i.e., double vision, which is sometimes very distressing to the patient. In mild and early cases diplopia can be corrected with prismatic glasses. If the eye is left untreated it loses its vision and becomes blind in course of time.

**Preservation of Eyesight.** The precautionary measures for the preservation of eyesight cannot be adopted too early, in fact they should commence as soon as the child is born. Many cases of blindness are due to infection of the eyes taking place at the time of birth and the commonest and the most dangerous infection is gonorrhoeal which takes place if the mother's genital canal has recent or old infection. It may not be noticeable in the infant before irreparable damage is done to the eyes. To guard against the danger of any kind of infection during birth the eyes should be well washed as a routine soon after the child is born with boric lotion and if there is the least suspicion of gonorrhoeal infection a couple of drops of argyrol solution (30 grains to the ounce) should be put into the eyes twice daily for a few days. Penicillin powder is also used for dusting into the eyes. After birth infection is liable to be conveyed through unclean towels or by flies alighting on the eyes when the child is asleep. To guard against this the cradle should be covered with a mosquito net or the eyes protected with a piece of gauze or netting. Dust is another source of infection.

The practice of applying *kohl* or *kajal* to the eyes of children with the mistaken idea of improving the eyesight, or among certain ignorant classes, to avert the evil eye, is also responsible for many cases of blindness. This is applied with a thin metal or wooden rod dipped

in the preparation, which may be anything, and rubbed on the margin of the lids with some force because the child resents and shuts the eyes during application. This is liable to injure the delicate cornea and set up ulceration which results in opacity and blindness. The corneal tissues, when damaged, do not have the power of regeneration.

Errors of refraction, if neglected and not corrected with glasses, tend to get worse and might ultimately end in blindness. Among the troublesome symptoms are frequent headache, giddiness, eye-strain, and in children inattention to study and mental dullness. For this reason the eyesight of every child about the age of seven or before commencing school should be examined by an ophthalmologist and the examination repeated periodically, if necessary. Many minor or even major defects of vision are not noticeable in the beginning or until they cause much damage, but if taken in hand early a good deal of trouble can be saved for the future. If the child holds the book further than one foot or too close to the eyes or keeps the head inclined to one side while reading his eyes need testing. In far-sighted people the constant effort of the eyes to bring the focus on the retina causes a spasm of the fine muscles of accommodation which might mask the defect for a time but it is sure to give trouble if allowed to continue for long without treatment.

The eye requires great care in its use if the normal vision has to be preserved for long. A few simple rules which are given here, if carefully observed, will save much trouble and even blindness in the future.

(1) If much near work has to be done the eyes should be given complete rest for a short period every half hour or so in order not to strain the delicate muscles of accommodation and give them time to recoup. They should be relaxed by looking at distant objects out of the window for a minute or two.

(2) No near work, such as reading, writing, sewing, etc., should be done unless the light is sufficient and no strain is put on the eyes. Such work should be avoided at night unless the lighting is quite good. Reading small types by artificial light should be avoided.

(3) When doing near work the light should come from behind, or if this is not possible, from one side, but never from the front.

(4) The head should be kept erect and not bent over the work; for this reason reading in bed is harmful. Constant bending of the head, apart from being injurious to the eyes, prevents free breathing and produces stooping deformity of the spine and is particularly harmful to the health of children.

(5) If the eyes get tired soon while doing near work an ophthalmologist should be consulted without delay and the defect of vision corrected with glasses.

(6) With the onset of presbyopia after 40 the help of glasses is necessary for near and later for distant vision, which should not be delayed.

(7) The presence of a foreign body is very irritating to the eye and liable to set up inflammation. In such cases there is a tendency

to rub the eye vigorously to dislodge the particle; but such practice is harmful and might damage the delicate corneal tissue. The best way to deal with it is to wash the eye with boric lotion. A very simple way to irrigate the eye is to soak a clean handkerchief or a piece of absorbent cotton in the lotion and squeeze it over the eye while the lids are kept apart with fingers. A special glass for douching the eye might be used. It is filled with the lotion and pressed lightly on the eyeball and the head thrown back keeping the glass in contact with the eye. While in this position the eyelids are opened and closed several times which allows the lotion to wash the eye. As the margins of the glass closely fit round the eyeball the lotion does not get spilled.

(8) Septic infection is liable to be conveyed to the eyes by flies, road dust, dirty handkerchiefs, towels, etc. Gonorrhoeal infection is readily conveyed by means of fingers, it is therefore very necessary for persons suffering from the disease to take every precaution to avoid this very dangerous infection of the eyes which might cause blindness. Fortunately, the introduction of sulpha drugs and penicillin has reduced this risk very much.

(9) Too frequent exposure of the eyes to the bright light of the sun without dark glasses or a properly made sola hat is very harmful and is likely to bring on cataract at an early age. For this reason it is a very common complaint in the tropics. The exposure of the eyes to the direct rays of the sun, as is sometimes done by children or by persons, through ignorance, trying to see an eclipse of the sun without dark glasses is dangerous and may result in total and permanent blindness. In the absence of dark glasses the eclipse can be safely seen through a piece of ordinary glass which is darkened on one side by smoke. Prolonged exposure to snow might also cause complete loss of vision (see Snow-blindness, page 152, Part I).

(10) Excessive use of tobacco is very harmful to the eyesight and may produce temporary or permanent blindness.

(11) Absence or deficiency of certain vitamins in the diet, especially vitamins A and D, is responsible for many eye troubles including night-blindness, softening of the cornea and ulceration, dryness of the conjunctiva or an encroachment of the conjunctiva on the cornea which might cause blindness by forming an opaque screen on it, and defective vision.

(12) In case of an injury to the eye, however trivial, professional help should be obtained immediately and in the meantime it should be washed with boric lotion and kept shut to prevent any further infection.

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